

BEYOND THE WATERS' EDGE:
COMPLEXITY AND CONSERVATION MANAGEMENT OF
UNDERWATER CULTURAL HERITAGE BY PUBLIC AGENCIES IN NORTH CAROLINA

by

Sarah Watkins-Kenney

April, 2019

Director of Dissertation: Dr. Charles Ewen

Major Department: Coastal Resources Management PhD Program

ABSTRACT:

This study used a mixed methods case study approach to investigate the nature and behavior of the system in North Carolina within which managers in its public agency for Archives and History have implemented public policy to conserve the state's underwater cultural heritage since the early 1960s. The study provides a history of conservation management of underwater cultural heritage in North Carolina, methodologies, and a conceptual framework to help conservation managers identify and understand contexts within which they are working as either traditional or complex management systems. By organization theory, understanding context is recognized as crucial for effective management. When physical remains of the past are discovered in state waters it may be obvious to a professional conservator what actions are needed. Deciding what actions are taken, however, lies with public agency managers - beyond the waters' edge. Factors investigated for this study were players' (public, political, professional) interests, conservation actions, and time. Data was analyzed from the perspectives of three public policy systems models. Archives and History's management system generally was found to be traditional, but six case study sites were identified as complex adaptive systems.

BEYOND THE WATERS' EDGE:
COMPLEXITY AND CONSERVATION MANAGEMENT OF
UNDERWATER CULTURAL HERITAGE BY PUBLIC AGENCIES IN NORTH CAROLINA

A Dissertation

Presented to the Faculty of the Department of Coastal Resources Management Program

East Carolina University

In Partial Fulfillment of the Requirements for the Degree

Doctor of Philosophy
Coastal Resources Management

by

Sarah Watkins-Kenney

April, 2019

© Sarah Watkins-Kenney 2019

BEYOND THE WATERS' EDGE:
COMPLEXITY AND CONSERVATION MANAGEMENT OF
UNDERWATER CULTURAL HERITAGE BY PUBLIC AGENCIES IN NORTH CAROLINA

by

Sarah Watkins-Kenney

APPROVED BY:

DIRECTOR OF
DISSERTATION: _____

Charles Ewen, Ph.D.

COMMITTEE MEMBER: _____

Nathan Richards, Ph.D.

COMMITTEE MEMBER: _____

Hans Vogelsong, Ph.D.

COMMITTEE MEMBER: _____

Siddhartha Mitra, Ph.D.

COMMITTEE MEMBER: _____

Mark Wilde-Ramsing, Ph.D.

CHAIR OF THE DEPARTMENT
OF COASTAL RESOURCES MANAGEMENT PROGRAM:

Siddhartha Mitra, Ph.D.

DEAN OF THE
GRADUATE SCHOOL: _____

Paul J. Gemperline, PhD

For

JMK

H.E.R.O.

Thank You

ACKNOWLEDGEMENTS

I thank East Carolina University for the opportunity to study as a PhD student in the Coastal Resources Management (CRM) Program, and my employer, the North Carolina Department of Natural and Cultural Resources (NCR), for accommodating and encouraging my pursuit of these studies. I thank my advisor, Dr. Charles Ewen for his guidance, encouragement, and persistence. I thank my committee members, Dr. Mark Wilde-Ramsing, Dr. Nathan Richards, Dr. Siddhartha Mitra, and Dr. Hans Vogel song for their expertise, insight, advice, and suggestions, as I needed. I also thank Dr. John Kenney and Dr. David Kimmel for their help and tuition on how I might analyze data.

Of my work colleagues, I especially I thank Madeline Spencer for providing me with copies of databases, archival materials and site files. I thank Mark Wilde-Ramsing for his mentorship, wisdom, and encouragement. I thank my many colleagues at the QAR Conservation Lab over the years for their forbearance of my pursuit of this academic goal.

I thank my fellow CRM student colleagues, for their friendship, collegiality, and shared liking for curry at lunchtime - especially Dr. Elizabeth Brown-Pickren, Dr. Deanna Swain, Dr. Michelle Covi, and Dr. Devon Eulie.

I thank my family – Watkins's and Kenney's - for their encouragement and support, and never complaining about the times I was not able to be with them. I thank my parents who would have been so delighted that I had finally got to this point. Last but not least, I thank my husband John Kenney for his tuition on how I might analyze data, and for his unstinting encouragement, support, and belief that I would “keep paddling” and eventually get it done.

Thank you All!

TABLE OF CONTENTS

LIST OF TABLES	x
LIST OF FIGURES	xv
LIST OF ABBREVIATIONS.....	xxiv
CHAPTER 1: INTRODUCTION.....	1
Introduction	1
Problem Statement	2
Purpose	5
Significance of Research.....	5
Research Approach	6
Research Questions	8
Data Sources and Collection Methods	8
Organization of Dissertation – Chapter Summaries	11
CHAPTER 2: METHODS AND MODELS	15
Introduction	15
Research Approach	15
Selection of Six UCH Case Studies.....	16
Factors and Indicators Investigated as System Variables.....	17
Data Sources and Collection Methods	22
Data Analyses	33
Data Analyses from Perspective of Three Public Policy Models.....	35
Summary	43

CHAPTER 3: PUBLIC MANAGEMENT: TRADITIONAL AND COMPLEX APPROACHES	44
Introduction	44
Public Policy, Public Agencies Public Management and Players	45
Traditional Scientific Approaches to Public Management	47
Public Management and Traditional and Complex Systems Theories	49
Summary	56
CHAPTER 4: COASTAL NORTH CAROLINA: PLACE AND PEOPLE.....	58
Introduction	58
Place: The Natural Coastal System of North Carolina	58
People: History and Demography of North Carolina’s Coastal Plain	63
North Carolina’s Changing Coastal Environment.....	72
Summary	75
CHAPTER 5: CONSERVING UNDERWATER CULTURAL HERITAGE	76
Introduction	76
Remains of the Past in Underwater Environments	76
Conservation Actions for Preservation of UCH	81
Changing Approaches to Conservation	94
Summary	95
CHAPTER 6: IMPLEMENTING PUBLIC POLICY FOR NORTH CAROLINA’S UCH	96
Introduction	96
Levels of Archaeological Actions for UCH Sites in North Carolina.....	98
Levels of Action Taken for UCH Sites in Coastal Counties	100
Levels of Action and Conservation Options for UCH Sites.....	105
Conservation Actions for Six UCH Sites	105
Categorizing Archaeological and Conservation Actions Taken for Six UCH Sites.....	145

Factors Influencing Conservation Actions	146
Summary	150
CHAPTER 7: PUBLIC INTEREST IN NORTH CAROLINA’S HISTORY AND UCH.....	151
Introduction	151
Reading Public Interest History and UCH in North Carolina	152
Visiting Public Interest History and UCH in North Carolina	164
Reading Public Interest in Six UCH Sites and ASAs: 1960-2017: Period Totals	174
Visiting Public Interest in Six UCH Sites and ASA: 1960-2017: Period Totals	177
Summary	179
CHAPTER 8: POLITICAL INTEREST IN HISTORY AND UCH IN NORTH CAROLINA	181
Introduction	181
Government Framework for History and UCH in North Carolina	182
Political Interest: Legislative Framework in North Carolina for History and UCH	183
Political Interest: Funding for North Carolina’s Public Agency for Archives and History	199
Political Interest: Legislation for UCH Sites and ASAs: 1960-2017: Period Totals	207
Political Interest: Appropriations for Six UCH Sites and ASAs: 1960-2017: Period Totals.....	208
Summary	212
CHAPTER 9: PROFESSIONAL INTEREST IN NORTH CAROLINA’S HISTORY AND UCH	215
Introduction	215
Professionals and North Carolina’s Public Agency for Archives and History	216
North Carolina Highway Historical Marker Program (NC HHM).....	219
North Carolina Listings on the National Register of Historic Places 1966-2016.....	227
North Carolina Underwater Sites Investigated by A&H: 1960-2010.....	231
Professional Interest in Six UCH Sites and Associated State Attractions (ASAs)	239

Summary	241
CHAPTER 10: ANALYSES AND MODELS	244
Introduction	244
The Cyclical Public Policy Process Model.....	245
Time Series Analyses and Dynamic Systems Model	254
Complex Adaptive System (CAS) Model	288
Summary	308
CHAPTER 11: CONCLUSION	310
Introduction	310
Summary of Study and Findings	312
A Conceptual Framework for Conservation Management of UCH	324
Future Conservation Management UCH in North Carolina	327
Conclusion	331
REFERENCES:	333
APPENDIX A: East Carolina University Institutional Review Board: Certificate and Conflict Statement.....	367
APPENDIX B: North Carolina Demography Data	372
APPENDIX C: Visit Numbers to NC State Attractions	376
APPENDIX D: Federal and State (NC) Legislation Affecting NC Archives and History	384
APPENDIX E: State (NC) Appropriations (\$) for NC Archives and History	388
APPENDIX F: Players: Interest Indicator Data for Six UCH Sites and Six ASAs	391
APPENDIX G: NC Highway Historical Highway Markers with Maritime Theme	403
APPENDIX H: Estimation daily circulation number articles North Carolina sources.....	405

LIST OF TABLES

TABLE 2.1. Six UCH sites selected for investigating the conservation management system of conservation of UCH in North Carolina.	17
TABLE 2.2. Independent and dependent variables investigated for conservation management of UCH in North Carolinan1960-2017	17
TABLE 2.3. All text keywords for database searches for indicators of public interest by numbers of articles in ANHC, and for professional interest by articles in Google Scholar	26
TABLE 2.4. Matrix model for characteristics of observed dynamics and causal systems for types of change over time	40
TABLE 5.1. Condition categories for wrecks in marine environments.....	79
TABLE 6.1. Frequency of references in 2016 <i>Bibliography</i> for UCH Sites in 2011 <i>Sites Database</i>	101
TABLE 6.2. Frequency of levels of action for UCH Sites (n=808) in OBX counties as listed in 2011 <i>Sites Database</i> from number of references per site found in 2016 <i>Bibliography</i>	102
TABLE 6.3. UCH Sites in IBX and OBX counties with more than six references in 2016 <i>Bibliography</i>	102
TABLE 6.4. Types of action undertaken for UCH sites in OBX counties at different levels of action	104
TABLE 6.5. Conservation options equated with levels of archaeological action (0, I, II, and III).	105
TABLE 6.6. Summary of six UCH case study sites	106
TABLE 7.1. Keywords searched on for indicators of levels of <i>reading public</i> interest - indicated by numbers of articles in <i>America’s News</i> (AN 2017) database	152
TABLE 7.2. Actual total number articles for main keyword searches for: history, museum, archaeology, and “cultural heritage” for North Carolina and US sources in <i>America’s News</i> database 1985-2014	153
TABLE 7.3. Actual total number articles for combined main keyword searches (history, museum, archaeology and “cultural heritage”) for North Carolina sources in <i>America’s News</i> database 1985-2014	154
TABLE 7.4. Total actual numbers articles for historic sites keyword searches, and numbers of articles as percentage of all North Carolina Articles 1986-2016.....	163
TABLE 7.5. Public interest: numbers of visits to historic sites in OBX counties 2010-2011	171
TABLE 7.6. Public interest: numbers of visits to state museums in OBX counties 2010-2011.....	172

TABLE 7.7. Public interest: numbers of visits to four historic sites in OBX counties, and to all historic sites in North Carolina.....	173
TABLE 7.8. Keywords searched in all text searches of ANHC database, for numbers of articles as indicators of levels public interest, and of Google Scholar online, for levels of professional interest	174
TABLE 7.9. Calculation of “Reading Public” (RP) number for total numbers of articles for six UCH Sites in ANHC database 1960/1961 to 2016/2017	176
TABLE 7.10. Reading public interest in six UCH Sites and ASAs as indicated by average number of articles in North Carolina newspapers 1960-2016/2017	177
TABLE 7.11. Visiting public interest in six UCH sites and ASAs as indicated by average number visitors for years under A&H management 1960-2016/2017	178
TABLE 8.1. Appropriations for A&H state attractions by type of site as share of total DCR appropriation from General Fund (GF) 2010/2011	203
TABLE 8.2. Appropriations received by DCR/A&H sites in 2010/2011 by region	206
TABLE 9.1. Frequency of UCH Sites in North Carolina by type of body of water	235
TABLE 9.2. Frequency UCH Sites in North Carolina by region and by theme of site	237
TABLE 9.3. Numbers of publications found on keyword searches for six UCH sites and six ASAs in Google Scholar.....	239
TABLE 10.1. Null Hypotheses: no correlation between levels of interest as rank ordered for sets of indicators for levels of interest and between levels of interest and conservation actions.....	246
TABLE 10.2. Conservation actions, conservation rank number, and conservation rank order for Six UCH Sites in North Carolina 1960-2017.....	247
TABLE 10.3. Indicators for players’ interest in Six UCH Sites and ASAs 1960/1961 to 2016/2017, as averages per year	247
TABLE 10.4. Rank Order (RO) indicator values for players interests (averages per year) and RO for conservation actions	248
TABLE 10.5. Spearman rank correlation coefficients (r_s) for pairs rank ordered sets of interest indicators, between levels of interest and conservation actions for six UCH sites	249

TABLE 10.6. Spearman rank correlation coefficient (r_s) calculated for pairs rank ordered sets of interest indicators, between levels of interest and conservation actions for six ASAs	250
TABLE 10.7. Descriptions of strengths Spearman’s correlation coefficients (r_s) for six UCH Sites.....	250
TABLE 10.8. Descriptions of strengths Spearman’s correlation coefficient (r_s) calculated for six ASAs.	251
TABLE 10.9. Critical values of Spearman’s ranked correlation coefficients (r_s)	251
TABLE 10.10. Critical values (p) of Spearman’s ranked correlation coefficients (r_s) for six UCH sites .	251
TABLE 10.11. Critical values (p) of Spearman’s ranked correlation coefficient (r_s) for six ASAs	251
TABLE 10.12. Matrix Model for characteristics of observed dynamics and causal systems for types of change over time.....	256
TABLE 10.13. Summary of change patterns visually identified by author from time series and return plots for biennial year-to-year percentage changes in interest indicator data for six UCH sites and six ASAs.....	286
TABLE 10.14a. Total numbers and percentages of change patterns visually identified from interest indicator time series and return plots for North Carolina, A&H, UCH sites and ASAs	286
TABLE 10.14b. Change patterns visually identified from interest indicator data time series for North Carolina, A&H, UCH sites and ASAs equated with traditional or complex management systems	287
TABLE 10.15. CAS Element: System boundary characteristics six UCH Sites identified by this study...	291
TABLE 10.16. CAS Element: Types of environment factors (exogenous and endogenous) identified by author as influencing processes (actions) taken by A&H agents in each six UCH Site Projects.....	291
TABLE 10.17. CAS Element: Agents in exogenous and endogenous environments of six UCH Sites	299
TABLE 10.18. CAS Element: Rules in exogenous and endogenous environments of six UCH sites	301
TABLE 10.19. CAS Element: Processes in six UCH sites as A&H projects	303
TABLE 10.20. CAS Element: Outcomes of six UCH sites as A&H Projects	304
TABLE 10.21. CAS Behaviors for which evidence found in six UCH sites as investigated by author	304
TABLE 10.22. Summary of official “Vision” statements as drivers for change in relation to or arising from six UCH sites as A&H projects.....	308
TABLE 11.1. Summary of type/approach of management systems (traditional or complex) as identified by author from analyses of players’ interest data from perspectives of three public policy models	323
TABLE B.1. Total NC population 1790-2010	372

TABLE B.2. Decadal change total NC white and black population 1920-2010	372
TABLE B.3. Decadal percentage change in total NC American Indian, Asian and Hispanic population .	372
TABLE B.4. Decadal percentage change in Total NC rural and urban population 1790-2010	373
TABLE B.5. Populations of 20 coastal counties (OBX)	374
TABLE B.6. Populations of 21 coastal counties (IBX)	374
TABLE B.7. Decadal percentage changes in North Carolina coastal region counties' Populations	375
TABLE B.8. Rank ordering of NC coastal counties by population in 2010	375
TABLE C.1 Numbers of visits to NC A&H historic sites and commissions, 1960-2014	376
TABLE C.2. Biennial year-to-year change in visit numbers to NC A&H historic sites: Fort Fisher and CSS <i>Neuse</i> , 1960-2014.	377
TABLE C.3. Biennial year-to-year change in visit numbers to NC A&H Museum of History and NC Maritime Museum, Beaufort, 1960-2014.....	378
TABLE C.4. Summary of numbers of visits to all NC State Attractions in 2010-2011	379
TABLE C.5. Summary of visit numbers to all NC State Attractions in 2010-2011	379
TABLE C.6. Visitor numbers in 2010-2011 to all NC DENR state parks and recreation areas	380
TABLE C.7. Numbers of visits to DCR Sites by region and theme	381
TABLE C.8. Numbers of visits to DCR Sites by region and theme	381
TABLE C.9. Numbers of visits in 2010-2011 to NC A&H museums by county and theme	381
TABLE C.10. Numbers of visits to A&H State Historic Sites in 2010-2011.....	382
TABLE C.11. Numbers of visits State Commissions in 2010-2011	382
TABLE C.12. Numbers of visits to DENR Museums in 2010-211.....	383
TABLE D.1. Biennial totals for numbers of federal and state legislations directly affecting A&H and UCH in North Carolina 1900-2015.....	384
TABLE D.2. Federal and state legislations directly affecting A&H and UCH in North Carolina 1903-1966.	385
TABLE D.3. Federal and state legislations directly affecting A&H and UCH in North Carolina 1967-1979	386
TABLE D.4. Federal and state legislations directly affecting A&H and UCH in North Carolina 1981-2015	387
TABLE E.1. Recurring appropriations (R\$) NC General Fund (GF) and from GF to A&H for biennial fiscal years 1958/1960 to 2012/2014	388

TABLE E.2. A&H appropriations from General Fund (GF), and allocation from A&H to archaeology, historic sites, Museum of History, NC Maritime Museum.....	389
TABLE E.3. Total recurring appropriations for sections within A&H from 1959/1960 to 2013/2014	390
TABLE F.1. <i>Modern Greece</i> : players’ indicator data	391
TABLE F.2. <i>CSS Neuse</i> : players’ indicator data.....	392
TABLE F.3. Lake Phelps Canoes: players’ indicator data	393
TABLE F.4. <i>USS Huron</i> : players’ indicator data.....	394
TABLE F.5. <i>Queen Anne’s Revenge</i> : players’ indicator data.....	395
TABLE F.6. “George Browne” Wreck: players’ indicator data.....	396
TABLE F.7. Fort Fisher Historic Site: players’ indicator data.....	397
TABLE F.8. <i>CSS Neuse</i> /Fort Caswell Historic Site: players’ indicator data	398
TABLE F.9. Pettigrew State Park: players’ indicator data	399
TABLE F.10. Jockey’s Ridge State Park: players’ indicator data.....	400
TABLE F.11. NC Maritime Museum, Beaufort: players’ indicator data	401
TABLE F.12. Graveyard of the Atlantic Museum, Hatteras: players’ indicator data.....	402
TABLE G.1. NC Highway Historical Markers in Piedmont (P) and Mountain (M) region counties with maritime theme.....	403
TABLE G.2. NC Highway Historical Markers in Coastal Plain Inner Banks counties (IBX) with maritime theme	403
TABLE G.3. NC Highway Historical Markers in Coastal Plain Outer Banks counties (OBX) with maritime theme	404
TABLE H.1. Numbers articles for UCH keyword searches in North Carolina news sources 1960-2017, and estimated daily circulation of news sources	405
TABLE H.2. North Carolina news sources approximate daily circulations 2010-2012.....	405

LIST OF FIGURES

FIGURE 2.1. Cyclical Public Policy Process (CPPP) Model	36
FIGURE 2.2. Periodic change pattern and return plot: mathematically generated (in Excel) time series (left) and return plot (right) for periodic change over time for one variable	38
FIGURE 2.3 Random change pattern and return plot: mathematically generated (in Excel) time series (left) and return plot (right)	38
FIGURE 2.4. Chaotic change pattern and return plot: mathematically generated (in Excel using May (1976) logistics equation) time series (left) and return plot (right)	39
FIGURE 2.5. Complex change pattern and return plot: biennial year-to-year percentage changes in number articles per 100,000 total North Carolina articles per biennial fiscal year for keyword searches in ANHC for “terrorist” return plot for period before 2000-2002	39
FIGURE 2.6. Complex Adaptive System Model (CAS): “6+4 Analytical Framework”	41
FIGURE 4.1. North Carolina’s coastal geologic provinces - northern and southern zones	60
FIGURE 4.2. North Carolina river basins	61
FIGURE 4.3. North Carolina rivers and lakes	61
FIGURE 4.4. North Carolina population 1790-2010	65
FIGURE 4.5. Percentage change in North Carolina population 1790-2010	66
FIGURE 4.6. All North Carolina population by race 1900-2010	67
FIGURE 4.7. Decadal percentage change in all North Carolina population by race 1900-2010	67
FIGURE 4.8. Total, urban and rural population of North Carolina 1900-2010	68
FIGURE 4.9. Decade-to-decade percentage change in total, urban and rural population of North Carolina 1900-2010	68
FIGURE 4.10. Population density of North Carolina in 2010	68
FIGURE 4.11. Population of Coastal Plain counties 1950-2010	69
FIGURE 4.12. Population of Coastal Plain counties as percentage of total North Carolina population	69
FIGURE 4.13. Population growths in North Carolina counties 2010-2015	70
FIGURE 4.14. Populations of 20 North Carolina OBX coastal counties, 1950-2010	70
FIGURE 4.15. Rank ordering of 20 North Carolina OBX coastal counties by population 1920-2010	71

FIGURE 5.1. Assessing potential for exposure of wrecks on the seabed.....	81
FIGURE 6.1. Location and number of known historic shipwrecks (n=2617) off the coast of North Carolina (excluding those lost in battle or through events such as fire or explosion)	97
FIGURE 6.2. Distribution of UCH sites and locations of six UCH case study sites in Coastal Plain counties of North Carolina as at 2011	98
FIGURE 6.3. Types of actions undertaken for UCH sites in OBX counties	104
FIGURE 7.1. Actual total number of articles for history set keywords (history, museum, archaeology, and “cultural heritage”) in all North Carolina and all US sources in <i>America’s News</i> database 1985-2014.....	154
FIGURE 7.2. Actual numbers of articles in North Carolina sources 1985-2014 in <i>America’s News</i> database for history set and history subset keyword searches	155
FIGURE 7.3. People group: actual number of articles for history set and subset keywords	157
FIGURE 7.4. People group: actual number of articles for history set and subset keywords as percentage of total actual number of articles for history set keyword only	157
FIGURE 7.5. Military group: actual number of articles for history set and subset keywords	157
FIGURE 7.6. Military group: actual number of articles for history set and subset keywords as percentage of total actual number of articles for history set keyword only	157
FIGURE 7.7. Economy group: actual number of articles for history set and subset keywords.....	158
FIGURE 7.8. Economy group: actual number of articles for history set and subset keywords as percentage of total actual number of articles for history set keyword only	158
FIGURE 7.9. Activity group: actual number of articles for history set and subset keywords.....	159
FIGURE 7.10. Activity group: actual number of articles for history set and subset keywords as percentage of total actual number of articles for history set keyword only	159
FIGURE 7.11. Place group: actual number of articles for history set and subset keywords	159
FIGURE 7.12. Place group: actual number of articles for history set and subset keywords as percentage of total actual number of articles for history set keyword only	159
FIGURE 7.13. Number of articles (actual) for keyword search on “underwater cultural heritage” 1985-2014 in all US articles for total number of articles = 66)	160

FIGURE 7.14. Number of articles by States for keyword search on “underwater cultural heritage” for 2012 in all US articles	160
FIGURE 7.15. Total actual number articles for OBX county name and history set main keywords in all North Carolina articles 1985-2016.....	161
FIGURE 7.16. Percentages of actual number of articles for history set keywords and OBX county names of total actual number of articles for OBX county names only	162
FIGURE 7.17. Total number of articles for keyword search on “scuba” in North Carolina and US Sources 1985-2014	164
FIGURE 7.18. Total number of scuba and scuba subset keywords as percentage of total number of articles for “scuba” only in North Carolina and US Sources, 1985-2014.....	164
FIGURE 7.19. Number of visitors to North Carolina 2010-2015 (total, overnight and daytrips).....	165
FIGURE 7.20. North Carolina residents as percentage of total, overnight and day-trip visits 2010-2015	165
FIGURE 7.21. Overnight and day-trips by white and black visitors as percentages of total visits in North Carolina 2010-2015	166
FIGURE 7.22. Overnight visitor activities 2010-2015 as percentages of total visits per year	167
FIGURE 7.23. Numbers of visitors in 2010-2011 to North Carolina state attractions (DCR and DENR) state parks, museums, historic sites, commissions, aquaria, and zoo	168
FIGURE 7.24. OBX resident population and number of visits to DCR and DENR sites 2010-2011	170
FIGURE 7.25. Numbers of DENR and DCR state attractions in OBX counties in 2010-2011	170
FIGURE 7.26. Numbers of visitors to state attractions in OBX counties compared to county populations in 2010.....	171
FIGURE 7.27. Locations of state historic sites (including four commissions)	172
FIGURE 7.28. Decadal visitor numbers to state historic sites (Fort Fisher, Brunswick, Somerset Place, and Bath) as percentage of total number of visitors to all historic sites in state 1960-2010.....	173
FIGURE 7.29. Percentages of total number of relevant articles for each of six UCH Sites and ASAs 1960/1961-2016/2017.....	175
FIGURE 7.30. Comparing “Reading Public” (circulation) with Reading Public (total number of articles for six UCH sites 1960/1961 to 2016/2017	176

FIGURE 8.1. County map of North Carolina	184
FIGURE 8.2. Numbers of federal and state legislations affecting archives and history in North Carolina, per decade 1900-2015.....	184
FIGURE 8.3. North Carolina state budget annual General Fund (GF) (\$) and A&H appropriations from GF (\$) 1949/1950 to 2013/2014.....	200
FIGURE 8.4. A&H annual appropriations as percentage of actions for UCH sites in OBX Counties.....	200
FIGURE 8.5. Total appropriations (\$) for A&H sections 1959/1960 to 2013/2014	201
FIGURE 8.6. Number of sites by theme as percentage of total number DCR sites and appropriations for sites by theme as percentage of DCR appropriation in 2010-2011.....	204
FIGURE 8.7. Appropriations for all DCR sites by theme, as percentage of total DCR appropriation in 2010-2011	204
FIGURE 8.8. Appropriations (\$) per DCR site by theme.....	205
FIGURE 8.9. Average appropriation per site for DCR sites by theme as percentage of total DCR average appropriation per site in 2010-2011.....	205
FIGURE 8.10. Appropriations for A&H Sites in OBX counties as percentage of total DCR appropriation (n=\$28.8 million) in 2010/2011	206
FIGURE 8.11. Appropriations for A&H Sites in OBX counties as percentage of total DCR appropriation (\$28.8 million) from General Fund in 2010/2011	206
FIGURE 8.12. Legislation Acts for six UCH sites and ASAs 1960-2017	207
FIGURE 8.13. Percentages total non-recurring appropriations for six UCH sites and ASAs 1960-2017.	212
FIGURE 9.1. Numbers of A&H staff 1910 to 2014.....	217
FIGURE 9.2. Decade-to-decade percentage change in A&H staff 1910 to 2010, and in 2014	217
FIGURE 9.3. North Carolina Highway Historical Marker D-113 for <i>Modern Greece</i>	220
FIGURE 9.4. Frequency of Highway Historical Markers by number of counties.....	221
FIGURE 9.5. Percentage of total number (n=1580) of North Carolina Highway Historical Markers by region in April 2017.....	221
FIGURE 9.6. North Carolina Highway Historical Markers in Coastal Plain IBX counties	222
FIGURE 9.7. North Carolina Highway Historical Markers in Coastal Plain OBX counties	222

FIGURE 9.8. Frequency of Highway Markers characterized by keyword “maritime” as assigned in NCHHM database (2011) by region as percentage of total number of maritime markers	223
FIGURE 9.9. Percentage of maritime Highway Markers in OBX counties	223
FIGURE 9.10. Frequency of maritime markers by sub-themes	224
FIGURE 9.11. War period commemorated as percentage of total number maritime markers	224
FIGURE 9.12. Percentage of Civil War maritime markers and years cast.....	225
FIGURE 9.13. Frequency of maritime/military/Civil War theme Highway Markers by region as percentage of total number of military markers	225
FIGURE 9.14. Frequency of military and military/Civil War themed Highway Markers in Coastal Plain OBX counties.....	226
FIGURE 9.15. Frequency of North Carolina National Register Historic Places in Coastal Plain IBX counties at end 2016	228
FIGURE 9.16. Frequency of North Carolina National Register Historic Places in Coastal Plain OBX counties as at end of 2016.....	228
FIGURE 9.17. Frequency of all North Carolina National Register Historic Places by theme as percentage of total number sites.....	230
FIGURE 9.18. Frequency of all North Carolina National Register Historic Places in regions by theme, number of sites per theme as percentage of total number in region.....	230
FIGURE 9.19. Frequency of archaeology and UCH sites on North Carolina National Register Historic Places by Coastal Plain OBX counties as at end 2016	231
FIGURE 9.20. Frequency of Archaeology and UCH sites on North Carolina National Register Historic Places added per decade 1960-2015	231
FIGURE 9.21. Numbers of UCH Sites in Coastal Plain counties first investigated 1960-2010.....	233
FIGURE 9.22. Frequency UCH sites (total 87) in Coastal Plain IBX counties.....	234
FIGURE 9.23. Frequency of UCH sites (total 839) in Coastal Plain OBX counties	234
FIGURE 9.24. Percentages of all UCH sites (n= 942) by type of location environment	235
FIGURE 9.25. Frequency of river located UCH sites investigated 1960-2010 (n=543).....	235

FIGURE 9.26. Frequency of UCH Sites listed in 2011 <i>Sites Database</i> by body of water in Coastal Plain OBX counties.....	236
FIGURE 9.27. Frequency (log scale) of coastal and off shore sites by geologic location and type of body of water	236
FIGURE 9.28. Frequency of UCH sites by theme category in Coastal Plain OBX counties categorized by theme	238
FIGURE 10.1. A Cyclical Public Policy Process (CPPP) Model.....	245
FIGURE 10.2. Rank order (RO) values for interest indicator values for six UCH sites for average values per year for period 1960/1961-2016/2017	249
FIGURE 10.3. Rank order (RO) values for interest indicator values for six ASAs for average values per year for period 1960/1961-2016/2017.....	249
FIGURE 10.4. Periodic change pattern and return plot: mathematically generated (in Excel) time series pattern (left) and return plot (right) for periodic change over time for one variable	255
FIGURE 10.5. Random change pattern and return plot: mathematically generated (in Excel) time series pattern (left) and return plot (right)	255
FIGURE 10.6. Chaotic change pattern and return plot: mathematically generated (in Excel using May (1976) logistics equation) time series (left) and return plot (right)	255
FIGURE 10.7. Complex change pattern (left) and return plot (right): biennial year-to-year percentage changes in number articles per 100,000 total North Carolina articles (ANHC) per biennial fiscal year for keyword searches for “terrorist”. Return plot for period before 2000-2002.....	256
FIGURE 10.8. Random change: time series (above) and return plot (below) for biennial year-to-year percentage changes in actual totals all articles in North Carolina sources (ANHC) per biennial fiscal year	257
FIGURE 10.9. Complex change: time series (above) and return plot (below) for biennial year-to-year percentage changes in total normalized number articles (per 100,000) in North Carolina sources (ANHC) per biennial fiscal year for all six UCH sites (normalized n=488). Note: for 1960-1962 percentage change value was actually 3,133 percent, but reduced scale to fit the plot.....	258

FIGURE 10.10. Complex change: time series for biennial year-to-year percentage changes in normalized number articles (per 100,000) in North Carolina sources (ANHC) per biennial fiscal year for keyword searches for six UCH sites	259
FIGURE 10.11. Actual number articles per year on keyword searches for articles related to <i>Modern Greece</i> , 1860-2016, in North Carolina sources in ANHC and HNCDC. ANHC n=123, HNCDC n=110. Peaks are at 1862, 1962, 2012	260
FIGURE 10.12. Random change: time series (above) and return plot (below) for biennial year-to-year percentage changes in number articles per 100,000 articles in North Carolina sources per biennial fiscal year for combined results for keyword searches for all six ASAs (normalized n=488)	261
FIGURE 10.13. Time series plots for biennial year-to-year percentage change in articles per 100,000 articles in North Carolina sources (ANHC) for keyword searches for each of six ASA sites	262
FIGURE 10.14a-f. Return plots for biennial year-to-year percentage changes in number articles per 100,000 articles in North Carolina sources (ANHC) per biennium, for keyword searches for six ASA sites	263
FIGURE 10.15. Time series (above) and return plot (below) for total actual visitor numbers and biennial year-to-year percentage changes in numbers of visitors to four ASAs (Fort Fisher Historic Site, CSS <i>Neuse</i> Historic Site, North Carolina Maritime Museum, Graveyard of the Atlantic Museum)	264
FIGURE 10.16. Biennial year-to-year percentage changes for total numbers of visitors to each of six ASA Sites per biennium.....	265
FIGURE 10.17a-c. Return plots for biennial year-to-year percentage changes in numbers of visitors to ASAs: a) Fort Fisher Historic Site (<i>chaotic</i> change pattern), b) CSS <i>Neuse</i> Historic Site (<i>random</i> change pattern), c) North Carolina Maritime Museum (uncertain change pattern as too few data points to identify).....	266
FIGURE 10.18. Time series (a) and return plots (b) for all North Carolina Session Laws - total actual number of acts and biennial year-to-year percentage changes in numbers of Acts (n=28,899)	267
FIGURE 10.19. Time series (a) and return plots (b) for 25 North Carolina Session Laws - total actual number of Acts and biennial year-to-year percentage changes in numbers of Acts (n=25) for <i>Modern Greece</i> , CSS <i>Neuse</i> , and <i>Queen Anne's Revenge</i>	267
FIGURE 10.20. Time series (above) and return plot (below) for 66 North Carolina Session Laws - total actual number of Acts and biennial year-to-year percentage changes in numbers of Acts (n=66) for six ASAs .	268

FIGURE 10.21. Time series (above) and return plots (below) for A&H total appropriations from North Carolina General Fund and biennial year-to-year percentage changes in appropriations	270
FIGURE 10.22. Time series plots for biennial year-to-year percentage changes in total appropriations (\$) for: A&H, Historic Sites (HS), North Carolina Maritime Museum (NCMM), Office of State Archaeology (OSA), and <i>Queen Anne's Revenge</i> (QAR)	270
FIGURE 10.23. Return plots for biennial year-to-year percentage changes in total appropriations for historic sites (left) and for North Carolina Maritime Museum (right) 1960-2016.....	271
FIGURE 10.24. Actual amounts of <i>non-recurring appropriations</i> (NR\$) for three of UCH sites and six ASAs per biennium	271
FIGURE 10.25. Funding for <i>Queen Anne's Revenge</i> Project 1997-2016	272
FIGURE 10.26. Time series (above) and return plot (below) for biennial year-to-year percentage changes in all sources funding for <i>Queen Anne's Revenge</i> Project 1997-2016.....	273
FIGURE 10.27. Time series (above) and return plot (below) for biennial year-to-year percentage changes in recurring appropriations (R\$) for <i>Queen Anne's Revenge</i> Project 1997-2016	274
FIGURE 10.28. Time series (above) and return plot (below) for biennial year-to-year percentage changes in non-recurring appropriations (NR\$) for <i>Queen Anne's Revenge</i> Project 1997-2016.....	275
FIGURE 10.29. Time series for biennial year-to-year percentage changes in non-recurring appropriations (NR\$) for Fort Fisher Historic Site 1960-2016	276
FIGURE 10.30. Time Series for biennial year-to-year percentage changes in non-recurring appropriations (NR\$) for CSS <i>Neuse</i> and Historic Site 1960-2016	276
FIGURE 10.31. Time Series (above) and return plot (below) for biennial year-to-year percentage changes in number publications in Google Scholar for keyword search on "the"	277
FIGURE 10.32. Time series (above) and return plot (below) for biennial year-to-year percentage changes in number publications in Google Scholar for keyword search for all UCH sites (n=469)	278
FIGURE 10.33. Time series (above) and return plot (below) for biennial year-to-year percentage changes in number publications in Google Scholar for keyword search for all ASAs sites (n=444)	279
FIGURE 10.34. Time series for biennial year-to-year percentage changes in number publications in Google Scholar for keyword search for six UCH sites (n=469).....	279

FIGURE 10.35. Time series (above) and return plot (below) for biennial year-to-year percentage changes in number publications in Google Scholar for keyword search for <i>Modern Greece</i> (n=38)	280
FIGURE 10.36. Time series (above) and return plot (below) for biennial year-to-year percentage changes in number publications in Google Scholar for keyword search for <i>CSS Neuse</i> (n=67).....	281
FIGURE 10.37. Time series (above) and return plot (below) for biennial year-to-year percentage changes in number publications in Google Scholar for keyword search for <i>Queen Anne’s Revenge</i> (n=250).....	282
FIGURE 10.38. Time series and return plots for biennial year-to-year percentage changes in number publications for keyword search for six ASA sites (n=444).....	282
FIGURE 10.39. Time series (above) and return plot (below) biennial year-to-year percentage changes for all references in 2016 <i>Bibliography</i> (n=923).....	283
FIGURE 10.40. Time series (above) and return plot (below) for biennial year-to-year percentage changes in number references for Lake Phelps canoes in 2016 <i>Bibliography</i> (n=57)	284
FIGURE 10.41. Time series (above) and return plot (below) for biennial year-to-year percentage changes in number of references for <i>Queen Anne’s Revenge</i> in 2016 <i>Bibliography</i> (n=129).....	285
FIGURE 10.42. Types of change patterns identified for all North Carolina, A&H, UCH, and ASAs as percentages of total number of change patterns identified and plotted in each category.....	286
FIGURE 10.43. Complex Adaptive System Model (CAS): “6+4 Analytical Framework”	290
FIGURE 11.1. A conceptual framework for conservation management of UCH in North Carolina	325
FIGURE 11.2. Conservation management status for six UCH sites in North Carolina in 2014. Key: MG = <i>Modern Greece</i> , CSSN = <i>CSS Neuse</i> , LPC = Lake Phelps Canoes, USSH = <i>USS Huron</i> , QAR = <i>Queen Anne’s Revenge</i> , GBW = “George Browne” wreck	326
FIGURE 11.3. Summary of status of investigations and conservation of North Carolina’s UCH since 1960s as at 2018.....	328
FIGURE 11.4. Locations of Coastal Plain A&H managed sites and state attractions since 2015 including: historic sites, museums, state parks, A&H, OSA, and QAR Lab at ECU	328
FIGURE 11.5. A proposed hubs approach for future conservation management of North Carolina’s UCH	331

LIST OF ABBREVIATIONS

A&H	North Carolina's Public Agency for Archives and History
A&H BR	Archives and History Biennial Report
A&H/OSA/UAB	Archives and History/Office of State Archaeology/Underwater Archaeology Branch
AHD	Authorized Heritage Discourse
AN	America's News
ANHC	America's News - Historical and Current
APES	Albemarle-Pamlico Estuary System
ASA	Associated State Attraction
BOB	Bodie Island (Oregon Inlet to Currituck/Dare County Line)
BUI	Beaufort Inlet
BY2Y%	Biennial Year to Year Percentage Change
CAMA	Coastal Area Management Act (1974) – North Carolina G.S.113A-101
CAS	Complex Adaptive System
CFR	Cape Fear River
CFR	Code Federal Regulations
CKB	Currituck (Currituck/Dare County Line to NC-VA State line)
CPPP	Cyclical Public Policy Process Model
CSS	Confederate States Ship
CSSN	CSS <i>Neuse</i>
DENR	Department Environment and Natural Resources
DSM	Dynamic Systems Model
ECU	East Carolina University
FF	Fort Fisher
FTE	Full Time Equivalent (staff positions)
GBW	“George Browne” Wreck (also spelt George Brown)
GF	General Fund
GOAM	Graveyard of the Atlantic Museum, Hatteras
G.S.	General Statute
GS	<i>Google Scholar</i>
HMS	His/ Her Majesty's Ship
HNCDC	Historical North Carolina Digital Newspaper Collection
HP	Historic Preservation
HS	Historic Site
IBX	Inner Banks Counties (NC Coastal Plain)

ICOM- CC	International Council of Museums – Conservation Committee
ICON	Institute for Conservation (UK)
IRB	Institutional Review Board
LIDAR	Light Detection and Ranging
LPC	Lake Phelps Canoes
MG	<i>Modern Greece</i>
NC	North Carolina (State Government)
NC CCC	North Carolina Confederate Centennial Commission
NCMM	North Carolina Maritime Museum, Beaufort
NC A&H	North Carolina Department/Division/Office of Archives and History
NC/A&H/OSA	North Carolina/ Division Archives and History/ Office of State Archaeology
NC DCR	North Carolina Department of Cultural Resources
NC DEHNR	North Carolina Department Environment, Health, and Natural Resources
NC DENR	North Carolina Department Environmental and Natural Resources
NC DEQ	North Carolina Department Environmental Quality
NC DTFSD	North Carolina Department of Commerce’s Division of Tourism, Film and Sports Development
NC GA	North Carolina General Assembly
NC HC	North Carolina Historical Commission
NC HHM	North Carolina Highway Historical Marker Program
NC OSBM	North Carolina Office State Business and Management
NC PED	North Carolina General Assembly Program Evaluation Division
NCR	North Carolina Department Natural and Cultural Resources
NCR/OAH/HR/SHPO	North Carolina Department Natural and Cultural Resources/Office Archives and History/Historic Resources Division/State Historic Preservation Office
NC NRHP	North Carolina National Register Historic Places
NC VP	North Carolina Visitor Profile Reports
NEI	New Inlet
NEPA	National Environmental Policy Act (1970)
NHPA	National Historic Preservation Act (1966)
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NR\$	Non-recurring state appropriation
NRHP	National Register Historic Places
NUR	Neuse River
OBX	Outer Banks CAMA Coastal Counties (NC Coastal Plain)
OSA	Office of State Archaeology

PHL	Lake Phelps
QAR	<i>Queen Anne's Revenge</i>
QAR LAB	<i>Queen Anne's Revenge</i> Conservation Lab
R\$	Recurring state appropriation
RAAR	Reburial and Analyses of Archaeological Remains Project
ROV	Remotely Operated (underwater) Vehicle
SHPO	State Historic Preservation Office (Officer)
SONAR	Sound Navigation Ranging
UAB	Underwater Archaeology Branch
UCH	Underwater Cultural Heritage
UNCW	University North Carolina Wilmington
UNESCO	United Nations Education, Scientific, and Cultural Organization
USS	United State Ship
USSH	USS <i>Huron</i>
WWI	World War I
WWII	World War II

CHAPTER 1

INTRODUCTION

“When the discovery...was announced...
a stark and menacing question immediately posed itself:
What should be done...?”
(Tise 1978:14).

Introduction

While it was still dark on the morning of 6 April 2010 professional staff from various state agencies and the public gathered at the water’s edge on Corolla Beach in North Carolina. They were there to participate in or just to witness the rescue of a Colonial Era shipwreck that was possibly the oldest yet discovered in North Carolina. The removal of this shipwreck from the beach was not a rescue in the usual sense of the word – this was not a disaster and no lives were threatened. It was an emergency action managed by professional staff of the State’s public agency for Archives and History (A&H) that differed from their normal policy of recording but then leaving such exposed beach wrecks where they were. The decision to change policy in this case was made by A&H senior managers in Raleigh - *beyond this water’s edge* - in response to public protest and political pressure to save the shipwreck - and so it was removed from the beach. (Hampton 2010 a, b; Henry and Watkins-Kenney 2010; Brown 2013).

Coastal North Carolina on the Atlantic seaboard of the United States with thousands of miles of waterways is a place to which people have been drawn for millennia to use its living and non-living resources. Physical evidence of past people’s activities survives into the present submerged in a range of underwater environments including in rivers, lakes, and ocean. Submerged remains of the past include thousands of shipwrecks off the coast in the “Graveyard of the Atlantic” (Babits 2002:119). Since the early 1960s with advances in underwater technologies such submerged remains have become more accessible and valued. For this study

Underwater Cultural Heritage (UCH) is defined as submerged physical remains of past human existence that have societal value and significance in the present. As UCH coastal resources may be valued variously for their historic, archaeological, educational, and economic use but other groups of people may have different even conflicting interests in them.

In 1967, North Carolina's State Legislature passed an "*Act to Establish Ownership of All Bottoms in Certain Waters and to Establish Procedures for Conducting Salvage of Abandoned Shipwrecks and other Underwater Archaeological Sites*" (NC 1967). This Act recognized the significance, value, and threats to thousands of underwater historical and archaeological sites already discovered off North Carolina's coast since 1962. These remains were considered valuable resources "... vital to the interpretation of North Carolina history, government, and culture to the citizens of the State". They were, however, in danger of destruction and loss through natural elements as well as from "... uncontrolled exploration, damage and removal ..." by commercial firms and others for their own monetary gain (NC 1967).

The organization with responsibility under the 1967 Act to implement this new policy was North Carolina's already established public agency for A&H (NC 1903). By the 1967 Act it was authorized to employ professional staff to undertake surveillance, survey, and systematic underwater archaeological recovery, and to protect and preserve underwater sites in state waters. Additionally, the agency was to establish control regulations and procedures including a permitting system under which other organizations and individuals might assist the work.

Problem Statement

When remains of the past are discovered in an underwater environment the problem arises of what to do about it (Tise 1978:14). For professionals - archaeologists and conservators - it may be obvious what actions are needed, or not, to protect and preserve material remains found

at a particular underwater site. In the USA, the task of public managers is to administer government functions and to implement the will of the state in executing public law and policy (Goodnow 1900; Wilson 1887). A&H's professional staff have to decide which actions to take for which sites. As public managers employed by a public agency, they also have to take actions effectively and efficiently in accordance with public law and policy for least cost with resources available. In North Carolina, with thousands of underwater sites this is no mean challenge.

Organization Theory proposes that essential for effective management is understanding the managing organization including its history, culture, context, and environment. Without analysis to gain such understanding action is only impulse (Handy 1985:16). So many variables, however, can influence organizational effectiveness that management researchers often focus on a particular area for study – for example, individuals, motivation to work, organization structure, internal systems and interactions within the organization (Handy 1985:14-16). For much of the 20th century a *traditional* systems approach to public management assumed public agencies as hierarchical bureaucracies were stable, ordered, predictable, and closed systems. Effective implementation of public policy would be by *traditional management* approaches. These included achieving organizational mission and goals through day-to-day problem solving, planning, control and monitoring. Assumed was a logical linear progression between cause and effect from inputs to actions to outputs to outcomes (Haynes 2003; Rainey 2009; Geyer and Rihani 2010:5). In heritage management an example of a project where a *traditional management* approach might be effective would be a new museum exhibit. The purpose and goal for the exhibit are clearly stated and known. There is a known end date for the project - the exhibit opening. Resources are adequate and predictable in amount and availability. There are

established organizational procedures for project managers and staff to follow to achieve the goal.

Since the 1990s, some public management researchers propose that rather than from a *traditional* approach public organizations and projects need to be understood from the perspective of *complexity theory*. Public agencies and projects may be operating as *complex* or *complex adaptive systems*. Such systems are unstable, dynamic, unpredictable and with non-linear progression from inputs to actions to outcomes achieved. In environments of open-ended and unpredictable change different management approaches to the *traditional* are needed. A *complex management* approach would acknowledge public agencies as open systems, effectively achieving tasks through informal structures, networks and partnerships with others outside the organization. These arrangements form and dissolve in response to unpredicted change. The task is achieved through facilitating access to and release of knowledge, expertise, creativity, and resources beyond as well as those already within the organization (Rosenhead 1998; Haynes 2003:5-28, 2008; Stacey et al. 2000; Carlisle and Christensen 2004:4; Stacey 2010; Geyer and Rihani 2010; Rhodes et al. 2011; Cairney 2012; Byrne and Callaghan 2014). An example of a *complex systems* approach for a UCH project might be the archaeological and historical investigations of *Vasa* (1628) the Swedish royal flagship recovered from Stockholm harbor in the early 1960s (Barkman 1977). To conserve, document, investigate, display, and publish this discovery, a national treasure, is an ongoing decade long, open-ended project, involving many different specialists in organizations and countries beyond Sweden. The work is managed and coordinated by the Vasa Project. It has resulted in almost 1,500 publications as listed in *Google Scholar* to end of 2018, as well exhibit of the ship in a dedicated museum in Stockholm.

Purpose

The purpose of this study was to understand from a systems perspective North Carolina's public agency for A&H's work to protect and preserve (i.e. conserve) the state's UCH since the early 1960s. The goal of the study was to propose a conceptual framework to help future managers understand the organization, its tasks and projects in relation to UCH. Understanding whether the nature and behavior of A&H as an organization in general and in case study projects in particular have characteristics of *traditional* or *complex* systems will help public managers determine appropriate management approaches for effective implementation of the state's public policy for UCH as established by the 1967 Act (NC 1967).

Significance of Research

For conservation of material cultural heritage, Mason and Avrami (2002:15) identified a need for integrated research that includes management, social contexts, and technical aspects to better understand factors influencing conservation actions. Most conservation research has focused on technical aspects. Some researchers have investigated conservation actions within museums and terrestrial cultural heritage contexts from a systems perspective (Keene 1996; Torre 2005; Hutchings and Cassar 2006; Robles 2010). Little research has focused on understanding the organizations within which conservation actions for UCH are taken (Firth 1996; Hannahs 2003; Ransley 2007). Conservation of any material cultural heritage is an ongoing process if longevity, usability, and value of a particular find or site are to continue into the indefinite future (Appelbaum 2007). Torre (2005:3) identified an information gap between theory and practice of application to specific cases, and a need for critical analyses of actual management practice. This study of a public agency and six UCH sites as case studies helps fill this information gap.

Some public management researchers have investigated other types of public project from the perspective of *complexity theory*. Haynes (2008) investigated dynamic trends in residential care provision for the elderly in Britain. Rhodes et al. (2011) investigated urban preservation projects in Ireland to determine if they were *complex adaptive systems*. This perspective, however, has not previously been applied to investigating public management by a particular public agency to conserve UCH. This study to understand the public agency for A&H's conservation management of UCH in North Carolina, therefore is important because it adds to scholarly research and literature, contributes a conceptual framework for understanding public management of conservation of material heritage, and will help to improve policy and practice.

Research Approach

This study used a *mixed methods case study approach* to investigate conservation management of UCH in North Carolina by the state's public agency for A&H. To gain a comprehensive understanding of the organization's actions in relation to UCH over time in general and for six case study projects in particular from a systems perspective, *qualitative* and *quantitative* data were collected and analyzed. Four of the six UCH case study sites investigated were identified historic shipwrecks: *Queen Anne's Revenge* (1718), *Modern Greece* (1862), *CSS Neuse* (1865), and *USS Huron* (1871). One was an unidentified early 17th century Corolla Beach wreck referred to as the "George Browne" Wreck by A&H staff after the man who reported it to them. The sixth was a group of Native American canoes discovered in Lake Phelps.

Public policy researchers assume three groups of players (public, political, and professional) are involved in its formulation and implementation (Kingdon 1995; Kraft and Furlong 2007). Reviewing forty years of A&H management of UCH in North Carolina Lawrence

(2011) observed that actions to conserve UCH had fluctuated over time in response to changing levels of public, political, and professional interest, staff capabilities and resources, as well as growing knowledge and technologies related to underwater archaeology and conservation. Key variables focused on for this study therefore were: levels of *players' (public, political and professional) interests, time, and type of conservation action.*

Levels of *players' interests* (as independent variables) may determine the type and degree of *conservation action* (as a dependent variable) for a particular site. As variables over time *conservation actions* and levels of *players' interest* in each UCH site project were examined and analyzed from the perspectives of three public policy systems models. This was to identify if by these variables these projects could be characterized as either *traditional* or *complex* systems. Data were analyzed, qualitatively and quantitatively from the perspectives of: A *Cyclical Public Policy Process Model* (Kraft and Furlong 2007:71-72), a *Dynamic Systems Model* (Dooley and Van de Ven 1999; Haynes 2008), and a *Complex Adaptive System Model* (Rhodes et al. 2011).

For each group of players two sets of interest indicator data were collected. From literature review and the author's professional experience five possible conservation options for UCH were identified: conservation ex situ, reburial, active conservation in situ, passive conservation in situ, and conservation by record. Conservation actions for UCH in North Carolina investigated for this study were characterized by these five options.

Qualitative analyses of data were used to construct a storyline for each site relating its history, characteristics, societal context, values and significance, and conservation actions taken. Site characteristics included date, period and type of site, location, environment, and condition. Qualitative analysis, including critical discourse analysis, identified factors influencing

conservation actions, management decisions, management approach, and outcomes of actions taken.

Quantitative analyses of data included time series analyses, inferential statistics, and multivariate analyses to investigate relationships and correlations between levels of players' interests and degrees of conservation action in each case, and how these changed over time (Dooley and Van de Ven 1999; Stephens 2004:25; Haynes 2008; Creswell 2009:13-14; Drennan 2009).

Research Questions

This study's investigations were focused by five research questions:

- RQ1 How can conservation of UCH be managed by public agencies?
- RQ2 How has conservation of UCH been managed by a public agency (A&H) in North Carolina?
- RQ3 How do levels of players' (public, political, and professional) interest in UCH influence and correlate with each other and with conservation actions taken?
- RQ4 What is the nature and behavior of the public agency organization in general and the case study projects in particular from a systems perspective; are they traditional or complex systems?
- RQ5 How can understanding past conservation management contexts and decisions inform future conservation management of UCH in North Carolina?

Data Sources and Collection Methods

For levels of *public interest* in history, physical remains of the past, and UCH in North Carolina indicator data were collected for the *reading public* and the *visiting public*. A number of researchers hold that *public interest* in an issue is an essential pre-requisite to getting political

interest for the formulation and implementation of related public policy (Kingdon 1995; Ernst 2003:122-125; Kraft and Furlong 2007; Martin 2008:180). An example of this was the hull of a medieval wood ship discovered in the riverbank at Newport in Wales during a development project. Local and national government only supported its excavation and conservation as a result of public outcry and campaigning, including via the media, to “Save our Ship” (Roberts 2004). The news media, particularly newspapers have been long been regarded as effective means of getting and gauging public interest (McManamon 1991; Kuhn 2002:195-212; Benz and Liedmeier 2007:154-173). For this study therefore, the indicator for levels of *reading public interest* were numbers of relevant articles in North Carolina newspapers found by keyword searches of the online *America’s News Historic and Current database* (ANHC).

Numbers of visitors to state attractions associated with, or geographically close to, the six UCH sites were indicators of levels of *visiting public interest*. Data sources for visitor numbers were A&H Biennial Reports (NC A&H 1964; NC A&H 1974 to 2015), North Carolina Visitor Profile Reports for 2010 to 2015 (NC VP 2015), and a 2012 report of the North Carolina Program Evaluation Division on state run attractions in 2010-2011 (NC PED 2012).

For levels of *political interest* in history, physical remains of the past, and UCH in North Carolina, the two interest indicators were numbers of state *legislations* and amounts of state *appropriations* to A&H. Data sources for which included: NC Session Laws (<https://www.ncleg.gov/Laws/SessionLaws>), A&H Biennial Reports (NC A&H 1964; NC A&H 1974 to 2015) North Carolina Office of State Budget and Management Certified Budgets (NC OSBM 2013, 2015, 2016, North Carolina State Budgets (NC 1965; 1969; 2013), North Carolina Governors Budgets (McRory 2015), NC PED (2012) report, A&H UCH site archives, and newspaper reports online in *America’s News Historic and Current database* (ANHC).

For levels of *professional interest* in history, physical remains of the past, and UCH one interest indicator was numbers of relevant articles found by keyword searches of the *Google Scholar* online database to end of 2017 as undertaken in January 2018. The other indicator and its data source were numbers of references for a UCH site listed in the 2016 *Bibliography of North Carolina Underwater Archaeology* (NC A&H/OSA/UAB 2016). The online databases for the *North Carolina Highway Historical Markers Program* (NC HHM) and North Carolina sites on the *National Register of Historic Sites* (NC NRHP), were also sources for indicators of *professional interest* in general in North Carolina.

For this study data collection methods generally included: literature and document review, archive, database and media (newspaper articles) searches, and author's observations (Knowlton and Phillips 2009: 77-82; Yin 2009:99-126; Laven et al. 2010:195-212). Primary data sources, particularly for UCH site characteristics and *conservation actions* taken were the A&H archives. These included documents, site files, unpublished reports, email collations, and databases of the A&H Office of State Archaeology's Underwater Branch (UAB) at Kure Beach, and its *Queen Anne's Revenge* Conservation Lab (QAR Lab) located at East Carolina University, in Greenville, North Carolina.

Secondary data sources included: federal and state establishing and enabling legislations and legislative testimony, online news databases for newspaper articles, publications and research papers, theses and dissertations, A&H Biennial Reports, State Budgets, and reports commissioned by and submitted to North Carolina's General Assembly.

Data, also was gathered by observation and from the author's experience as an employee of A&H based at *Queen Anne's Revenge* Conservation Lab (QAR Lab) as its Director/Chief Conservator since 2003. The *Queen Anne's Revenge* (QAR) shipwreck project is one of the case

studies for this research. The proposed research was submitted to the East Carolina Institutional Review Board (ECU IRB) in 2013 and was certified exempt (Appendix A). The submission of the proposed research to East Carolina University Institutional Review Board (ECU/IRB) included a statement of and plan for management of potential Conflict of Interest (Appendix A).

Organization of Dissertation: Chapter Summaries

Chapter 2 – Methods and Models

This study used a *mixed methods case study approach* to investigate conservation management of UCH by the public agency A&H in North Carolina. To gain a comprehensive understanding of events over time and of the nature and behavior of the system, both *qualitative* and *quantitative* data were collected and analyzed. Chapter 2 describes: rationales for the research approach, factors investigated and data sought, data sources and collection methods, and data analysis including from perspectives of three systems models.

Chapter 3 – Public Management: Traditional and Complex Approaches

From literature review Chapter 3 describes changing approaches to public management, from a systems perspective including from *traditional* scientific and *complex* management systems perspectives.

Chapter 4 – Coastal North Carolina: Place and People

Chapter 4 from literature review describes aspects of North Carolina as place (its changing natural coastal system) and people (their history and changing demography) as components of the exogenous environment within which A&H's conservation management of UCH in the state takes place.

Chapter 5 –Options for the Conservation of Underwater Sites as Cultural Heritage

Chapter 5 from literature review and the author's experience first describes what happens to physical remains of the past in underwater environments and then options for their conservation. In the second part of this chapter from a technical and scientific perspective five possible strategies as *conservation actions* (*conservation ex situ*, *reburial*, *active conservation in situ*, *passive conservation in situ*, and *conservation by record*) are described. In the third part of the chapter changing approaches to conservation of material cultural heritage are reviewed.

Chapter 6 – Implementing Public Policy for North Carolina's UCH

A secondary research question (RQ2) for this study was how has UCH in North Carolina been managed by the public agency A&H. Towards understanding this the author investigated types of archaeological and conservation actions taken by A&H for North Carolina UCH sites. The first part of Chapter 6 describes actions for UCH in general and the second part for the six case study sites in particular since the 1960s as a way to not only understand what was done but to also identify factors influencing actions taken.

Chapter 7 – Public Interest in North Carolina's History, Remains of the Past and UCH

Chapter 7 describes the results of the author's investigation of levels and types of *public interest* in North Carolina for history, remains of the past and UCH generally since the early 1960s, and in relation to the six UCH case study sites in particular. Analyses of totals for various periods (time) of indicator data collected are described. Indicator data for *reading public interest* were numbers of relevant articles found for keyword searches of the *America's News* (AN 2017) and *America's News Historical and Current* (ANHC 2018) online databases. Indicator data for *visiting public interest* were numbers of visitors to sites and associated state attractions.

Chapter 8 – Political Interest in History and UCH in North Carolina

In Chapter 9, state government framework in North Carolina, including federal and state legislation relating to history, remains of the past, UCH, and for A&H are first reviewed. The second part of the chapter describes and compares levels of state funding for A&H in general, and for the six UCH case studies. Period totals for indicator data collected are reported and described. Indicators for levels of *political interest* were numbers of state legislative Acts and amounts of appropriations – both recurring (R\$) and non-recurring (NR \$). These indicators were chosen on the assumption that greater *political interest* would be reflected in more legislation enacted and more funding appropriated for particular programs or projects.

Chapter 9 – Professional Interest in Preserving History and Physical Remains of the Past in North Carolina

Chapter 9 describes results of the author's investigation regarding levels of *professional interest* in North Carolina history and UCH in general and in relation to six UCH case study sites in particular, since the 1960s. The first part of the chapter defines the term professional and describes professional activities of A&H as a public organization. The second part of the chapter first describes and quantifies general levels of activity in three A&H programs: the *NC Highway Historical Markers Program* (NC HHM), North Carolina listings on the *National Register of Historic Places* (NC NRHP), and NC *underwater sites* investigated by A&H since the early 1960s. Then data collected for two indicators that reflect levels of *professional interest* in the six UCH sites in particular are reported and described by period totals. Indicator data collected for levels of *professional interest* were numbers of publications found by keyword searches of *Google Scholar* online database and numbers of references listed (for each site) in the 2016 *Bibliography of North Carolina Underwater Archaeology* (NC A&H/OSA/UAB 2016).

Chapter 10 – Analyses and Models

Chapter 10 presents results of the author's analyses of data, as collected and described in Chapters 6-9, from the perspective of three public management systems models to characterize the nature and behavior of A&H as a system within which policy for UCH is implemented in North Carolina. Data collected by the author on *conservation actions* and levels of *players' interests* in six UCH sites and six associated state attractions (ASAs) was analyzed from the perspective of the *Cyclical Public Policy Process Model* (Kraft and Furlong 2007:71-72), a *Dynamic Systems Model* (Dooley and Van de Ven 1999; Haynes 2008), and a *complex adaptive system* (CAS) model (Rhodes et al. (2011).

Chapter 11 – Conclusion

This chapter first summarizes investigations and findings as presented in Chapters 1-10, from which a conceptual framework is then proposed for future conservation management of UCH in North Carolina. Recommendations are made by which conservation of UCH might be managed in future.

CHAPTER 2

METHODS AND MODELS

“Analysis is an important prerequisite of action...
action without analysis becomes mere impulse.”
(Handy 1985:16).

Introduction

This study used a mixed methods case study approach to understand from a systems perspective conservation management of *Underwater Cultural Heritage* (UCH) in North Carolina by the state’s public agency for Archives and History since the early 1960s. Implementation of public policy for conservation of UCH in general and for six UCH sites in particular was investigated. Factors as system variables for which data was collected and analyzed were levels of *players’ interest (public, political and professional)*, *conservation actions*, and *time*. This chapter describes: rationales for the research approach, factors investigated and data sought, data sources and collection methods, and data analysis including from perspectives of three systems models.

Research Approach

A mixed methods case study approach, with qualitative and quantitative methods of analysis, was used to investigate the nature and behavior of the public management system to conserve UCH in North Carolina. Evaluations of publicly supported projects and programs are a common topic for this research method (Yin 2009: 13, 18, 28, 46). A case study approach has been used by other researchers to investigate conservation management of cultural heritage (Torre 2005; Poulios 2010) and in other areas of public management (Haynes 2008; Rhodes et al. 2011). It was an appropriate approach for investigating conservation management of UCH by a public agency in North Carolina as how and why questions were being asked about

contemporary events - in that there are people still alive who were involved as well as it being a longitudinal study (Yin 2009:13, 49).

Selection of Six UCH Case Studies

Selection of the six UCH sites investigated was based on criteria used in a Getty Conservation Institute investigation of values-based site management of terrestrial cultural heritage sites (Torre 2005:11):

1. Significance and value of the site recognized at least at State level.
2. Accessibility and completeness of records and documentation about the site.
3. Access to organization and players involved.
4. Management plan, other reports and information available on conservation actions taken over time.
5. Demonstrated interest and involvement of the public in the site.
6. Evidence of political interest.
7. Demonstrated interest and activity by professionals (archaeologists, conservators).
8. Some degree of conservation activity at the site.
9. Evidence of consideration of values and condition of the site when determining conservation strategy.
10. Evidence of conflicting views and their resolution (or not).

The six UCH sites selected for this study are listed in Table 2.1. Four were identified historic shipwrecks: *Queen Anne's Revenge* (1718), *Modern Greece* (1862), *CSS Neuse* (1865), and *USS Huron* (1871). One was an unidentified, early 17th century, beach wreck known as the "George Browne" Wreck". The sixth was Lake Phelps in which Native American dugout log canoes were discovered in the mid-1980s.

Site No.	Site Name	Location	Environment
NE10001	<i>Modern Greece</i>	New Inlet, Onslow Bay (south) near Fort Fisher, New Hanover County	Ocean
NUR001	<i>CSS Neuse</i>	River Neuse, Kinston, Lenoir County	River
PHL0001- PHL0022	Lake Phelps Canoes	Lake Phelps, Pettigrew State Park, Washington/Tyrrell Counties	Lake
BOB0012	<i>USS Huron</i>	Nags Head, Hatteras Bay, Dare County	Ocean
31CR314	<i>Queen Anne's Revenge</i>	Beaufort Inlet, Onslow Bay (north), Carteret County	Ocean
CKB0022	"George Browne" Wreck	Corolla Beach, Hatteras Bay, Currituck County	Ocean Beach

TABLE 2.1. Six UCH sites selected for investigating the conservation management system of conservation of UCH in North Carolina. (Table by author, data source: 2011 Sites Database (NC A&H/OSA/UAB 2011)).

Factors and Indicators Investigated as System Variables

Factors as key variables investigated for this study were levels of *players' interest* (*public, political and professional*), *conservation actions*, and *time*. Factors, indicators and data sources are summarized in Table 2.2.

Independent Variables	Factor	Indicator and (Main Sources for Data)	Measure
Public Interest	Reading	Articles in North Carolina newspapers (ANHC)	number/year
	Visiting	Visits to state run attractions in North Carolina (NC PED 2012; A&H Biennial Reports)	number/year
Political Interest	Legislation	Federal and State legislation, (NC Session Laws)	number/year
	Funding	State appropriations recurring and non-recurring, (NC Session Laws, A&H Biennial Reports)	number/year
Professional Interest	Historic Places	NC Highway Markers (NC Highway Historic Markers - NC HHM)	number/year
	Historic Places	NC Sites listed on National Register Historic Places (NC HRP)	number/year
	Underwater Sites	Underwater sites inventoried and actions taken (2011 Sites Database (NC A&H/OSA/UAB 2011; 2016 North Carolina Bibliography Underwater Archaeology (NC A&H/OSA/UAB 2016)	number/year
	Underwater Sites and Associated State Attractions	Numbers of publications and reports (Google Scholar; 2016 North Carolina Bibliography Underwater Archaeology (NC A&H/OSA/UAB 2016)	number/year
Dependent Variables	Factor	Indicator and (Main Sources for Data)	Measure
Conservation Activity	Conservation (C) Actions	C0: no action; C1: virtual/by record; C2: passive in situ; C3:Active in situ; C4: reburial; C5: conserve ex situ (2011 Sites Database (NC A&H/OSA/UAB 2011; 2016 North Carolina Bibliography Underwater Archaeology (NC A&H/OSA/UAB 2016); A&H/OSA/UAB archives and A&H Biennial Reports	levels and types of Conservation Actions per site

TABLE 2.2. Independent and dependent variables investigated for conservation management of UCH in North Carolina 1960-2017. (Table by author).

Public Interest Indicators

A number of public policy analysts hold that public interest in a problem can be an essential pre-requisite to getting public policy for it established and implemented (Kingdon 2003:65-67; Kraft and Furlong 2007:78). McManamon (1991:123-124) identified two groups of public interest in archaeology: those sufficiently interested to read about it in the news media, and those who also visited museums and sites. For this study these two groups are identified as the *reading public* and *visiting public* respectively.

As this study spanned 60 years from 1960 to 2016, newspaper articles rather than social media were used as indicators for levels of *reading public interest* in various aspects of UCH in North Carolina. Up until within the last ten years or so newspapers could reach the greatest possible number of people for a story. For example, in 1988 the *New York Times* had a daily circulation of approximately 1 million (Milanich 1991:41). Researchers investigating media coverage of archaeology have found it to be an important and effective way of stimulating public interest (Milanich 1991:41-42; Kuhn 2002:195-212; Kingdon 2003:58-60; Benz and Liedmeier 2007:154-173; Martin 2008:180).

Kuhn (2002:195-212) investigated how public opinion and press coverage affected archaeological project funding and policy decision-making through analyzing the content of 28 daily and weekly newspapers in New York State. From 1995 to 2000 there was at least one story every month. Articles focusing on archaeology were generally positive in contrast to stories connected with development projects that were more likely to be negative. Benz and Liedmeier (2007:154-173) investigated the language journalists used to create an interesting archaeological story. Through analyses of number, frequency, and type of archaeology articles from 1984 to 2005 in a newspaper and magazine database they found media interest in archaeology was high

but sensational discoveries received more attention than archaeological science. Local media focused on local stories. Articles tended to be written from a fun-action or discovery of the exotic and unknown viewpoint. Words used created an atmosphere of glamor and excitement.

Kingdon (2003:57-61) surveyed policy makers to determine how important mass media stories were for getting issues onto the political policy agenda. Twenty-six percent of those surveyed regarded it as important and four percent as very important. This result was less than expected. Kingdon proposed this was possibly because the policy process often takes years in contrast to the immediacy and short-term interest of mass media in a story, and also that the media tends to report on policy once action is decided and taken. The media was, however, a good communication method within the policy community and very effective for getting the attention of politicians as they were more likely to read the mass media than official reports and papers.

The news media, particularly newspapers, thus are an effective means of getting public interest, political attention, and for communication within the policy community. Articles on a particular topic can be an indication of public interest in it. Tracking numbers of articles on a particular subject over time can indicate if and how public interest in it changed over time. For this study therefore, the indicator for levels of *reading public interest* in history, remains of the past, and UCH in North Carolina was numbers of articles in North Carolina newspapers as found by keyword searches of online news databases.

The indicator for levels of *visiting public interest* in history, remains of the past, and UCH in North Carolina were numbers of visits to associated state attractions (ASA). The physical remains of UCH in North Carolina are mostly out of public view and not accessible. They may be at the bottom of the ocean and buried under sediments. If recovered

from a site remains may be in conservation facilities that are not open to the public. Ways in which the interested *visiting public* can access UCH is mostly by visiting related sites, such as exhibits at museums and events at locations associated with UCH.

Political Interest Indicators

Since at least the 1970s, it has been recognized that many of the public are interested in their past, its physical remains and in archaeology. With more public demand for access to this material cultural heritage it was expected that there would be pressure on government to pass legislation and provide resources to implement policy to preserve and protect it (Fagan 1977:119-121). Two indicators that issues of public concern have got onto the political agenda and become public policy are legislation and government funding at both federal and state level (Kraft and Furlong 2007:80-83). For this study, therefore, the two indicators for levels of *political interest* were numbers of State *legislations* (NC Session Laws) and amounts of funding by North Carolina General Assembly by *appropriations* to A&H, including for UCH.

Professional Interest Indicators

Professionals and researchers in a range of disciplines have researched, written reports and published in relation to history, archaeology and UCH. Keyword searches of *Google Scholar* by the author in January 2019, found over five million articles for “history”, over two million for “archaeology”, and over 6,000 for “underwater cultural heritage”. Thus, an indicator for areas and levels of *professional interest* in history, archaeology and UCH is numbers of related publications and reports. For this study the two indicators for levels of *professional interest* in history, remains of the past and UCH in North Carolina were the numbers of publications found by keyword searches of *Google Scholar* online database, and numbers of references listed for a

site in the 2016 *Bibliography of North Carolina Underwater Archaeology* (NC A&H/OSA/UAB 2016).

Additionally, to gain an understanding of *professional interest* generally in North Carolina's history, remains of its past and UCH, a critical discourse analyses was done of online databases for three A&H managed programs: the North Carolina *Highway Historical Markers Program* (NC HHM), North Carolina listings on the *National Register of Historic Places* (NC NRHP), and the A&H, Office of State Archaeology (OSA), Underwater Archaeology Branch (UAB) 2011 *Underwater Sites Database* (NC A&H/OSA/UAB 2011).

Conservation Actions

From review of the conservation literature (as described in Chapter 4) the author identified five categories of possible *conservation actions* for UCH: conservation ex situ, reburial, active preservation in situ, passive preservation in situ, and preservation by record. From primary and secondary sources data was collected for levels and types of conservation actions taken for UCH sites in North Carolina in general and for the six UCH sites in particular.

Time

Assuming A&H's aim is to preserve and protect the state's UCH into perpetuity understanding influencing factors and conservation actions over time is as important as understanding them at a particular time or in total. A dynamic system changes over time in its state relative to the external environment or to relationships amongst its component parts or to both (Room 2011:122). Investigating the dynamics of a system and models that capture patterned sequences of events in a particular organizational system can give insight into its dynamic behavior and whether it is behaving as a *traditional* system (stable, predictable, regular) or as a *complex* one (unstable, unpredictable and irregular) (Dooley and Van de Ven 1999; Haynes

2008). Data for sets of indicators of players' interests were collected and analyzed by biennial fiscal years (July 1-June 30). Biennial fiscal years being the legislative and budget appropriation cycles of North Carolina's state government to its public agencies.

Data Sources and Collection Methods

Data sources for this study included: published literature; A&H records, site archives, documents and databases; publicly available online databases; and the authors own experience, as an archaeological conservator and employee of A&H since 2003. (Laven et al. 2010:195-212; Yin 2009:99-126).

Primary sources for UCH site data were archives of North Carolina's public agency for A&H variously held at its: Office of State Archaeology (OSA) in Raleigh, Underwater Archaeology Branch (UAB) in Kure Beach, and *Queen Anne's Revenge* Conservation Lab (QAR Lab) in Greenville. These archives included documents (unpublished reports, management plans, letters, site plans, images, and emails) and databases (*Underwater Sites Database*, and *QAR Artifact Database*). For this study the author used copies of the 2011 *Underwater Sites Database* (NC A&H/OSA/UAB 2011) and the 2016 *Bibliography of North Carolina Underwater Archaeology* (NC A&H/OSA/UAB 2016). These were provided to the author by the OAH/OSA/UAB in Excel format. The *QAR Artifact Database* was available to the author as an Access database at the QAR Lab in Greenville.

Secondary sources searched by the author for data included: federal and state legislation (for evidence of *political interest*), newspaper articles (for *public interest*), online text descriptions for *North Carolina Highway Historical Markers* (NC HHM), and North Carolina listings on the *National Register of Historic Places*, and general literature review. Literature review provided information on public management systems and conservation options for UCH,

and enhanced understanding of North Carolina's coastal region as historical, geophysical, geographical, and demographic context within which A&H implements public policy for UCH. Publications, research papers, theses and dissertations gave information for constructing each UCH case study site storyline, as well as indications of levels of *professional interest* in it.

Data Sources and Collection Methods: Reading Public Interest Indicators

Sources for indicator data for North Carolina *reading public interest* in history, remains of the past and UCH in North Carolina were two online databases for North Carolina newspapers: *America's News-Historical and Current* (ANHC 2017) and the *Historic North Carolina Digital Newspaper Collection* (HNCDNC 2017). The more comprehensive and useable database for articles in North Carolina newspapers was found to be the *America's News Historic and Current* (ANHC) database. This was accessed through ECU's Joyner Library website at <http://infoweb.newsbank.com.jproxy.lib.ecu.edu/>. The ANHC database was the main source for *reading public interest* data for this study. The author collected data by keyword searches in 2011, 2015, 2017, and 2018. Until end of 2017, North Carolina sources in ANHC only dated from 1985 to 2017. By early 2018, however, the database had been expanded and included North Carolina sources back to the early 18th century.

The ANHC database can be searched including by keywords, year, state, and type of media. Search results list newspaper articles from a total of over 1,000 USA sources. North Carolina sources in the ANHC database were searched by keywords in the "All Text" field and by date in the Date field. For some keywords, searches also were made of all USA articles in the database for comparison to results for North Carolina. Numbers of articles per keyword search were collected in total and per biennial fiscal year.

For indications of *reading public interest* generally in history and remains of the past, searches were made for three sets of keywords: a history set, a historic site set, and a scuba set for the period 1985-2014. For keyword searches, total numbers of articles were collected. For indications of how interests might change over time the database was searched on some keywords per fiscal biennial years (July 1- June 30).

In 2018, the author made keyword searches of ANHC database for indications of *reading public interest* in the six UCH case study sites and associated state attractions (ASAs) for the period 1958 to 2016. For these keyword searches, total numbers of articles were collected. For some keywords, numbers of articles per fiscal biennial year (July 1- June 30) were collected to investigate change in interests over time.

History Set Keyword Searches of ANHC

For the “history” set searches of the ANHC database separately were made for keywords: history, museum, archaeology, and cultural heritage. Further searches were then made on combinations of these main keywords, and for main keywords in combination with subset keywords. Groups of subset keywords were selected by the author to give further information on areas of interest for each of the main keywords in relation to: *people, military, economy, activity, place, and heritage*. Subset keyword searches for each of these groups were: for *people group*- public, professional, white, black, African American, Native American, Indian, slave, pirate, and Blackbeard; for *military group*- American Revolution, War of 1812, Civil War, WWI, and WWII; for *economy group*- cost, budget, tourism, and economy; for *activity group*- education, research, science, preservation, protection, discovery, and conservation; for *place group*- site, in situ; maritime, underwater, shipwreck, ship, treasure, and artifacts; and for *heritage group*- “maritime heritage”, “submerged cultural heritage”, and “underwater cultural heritage”. To

investigate how public interest in history generally might vary by area of coastal North Carolina, history set main keywords also were searched in combination with names of twenty Outer Banks (OBX) coastal counties (OBX county set).

Historic Sites Set Keyword Searches of ANHC

To investigate levels of *reading public interest* in historic places and sites on land in North Carolina, keyword searches of the ANCH database were made on “historic site”, and on “historic site” in combination with four coastal historic sites managed by A&H: “Fort Fisher”, Brunswick, “Somerset Place”, and Bath.

Scuba Set Keyword Searches of ANHC

North Carolina’s coastal waters are popular destinations for scuba diving (NC VP 2015). To investigate levels of *reading public interest* in scuba diving, history, remains of the past and UCH, keyword searches were made of the ANHC database on “scuba” in combination variously with subset keywords: fishing, history, treasure, shipwrecks, archaeology, and “cultural heritage”.

UCH sites and Associated State Attractions (ASAs) Keyword Searches

To investigate levels of *reading public interest* in the six UCH case study sites and ASAs, keyword searches of the ANHC database were made in 2018, as listed in Table 2.3. Qualifiers had to be added for some of the keyword searches to exclude unrelated articles. “Modern Greece” was combined with “Fort Fisher” to exclude articles relating to the country Greece. Until about 1980, CSS *Neuse*, was mostly referred to in news articles as “Ram Neuse”, rather than CSS *Neuse*, so numbers of articles for both were collected. Articles about USS *Huron* did not invariably prefix *Huron* with USS but a keyword search on just “Huron” pulled up unrelated articles, for example, for Lake Huron. Therefore, for USS *Huron* related articles the keyword

search was done for “Huron” and “Nags Head”. The results still had to be screened for relevance to the 1877 shipwreck. For Lake Phelps canoes, keyword searches were made for “Lake Phelps” and “canoe” and results screened for those actually relating to the historic canoes. For the “George Browne” Wreck the keyword search was made on “Corolla” and “shipwrecks” to gauge *reading public* interest in beach shipwrecks at the location in general. From this search articles relevant to this particular shipwreck also were retrieved.

Keyword searches were also made for indications of *reading public interest* in state managed attractions on land directly associated with or exhibiting remains related to the six UCH sites (as listed in Table 2.3). There was, however, no state managed attraction on land directly associated with USS *Huron*. Therefore, data for *reading public interest* in the geographically nearest state attraction (Jockeys Ridge State Park) was collected to gauge levels of *reading public* interest at least in a state managed site not far from USS *Huron*.

UCH Site	All Text Keyword Searches (Main)
<i>Modern Greece</i> (MG)	"Modern Greece" and "Fort Fisher"
CSS <i>Neuse</i> (CSSN)	"CSS Neuse"
Lake Phelps Canoes (LPC)	"Lake Phelps" and "canoe"
USS <i>Huron</i> (USSH)	"Huron" and "Nags Head"
<i>Queen Anne's Revenge</i> (QAR)	"Queen Anne's Revenge"
"George Browne" Wreck, Corolla Beach (GBW)	"Corolla" and "shipwrecks"
State Attractions (UCH Site)	All Text Keyword Searches (Main)
Fort Fisher Historic Site (MG)	"Fort Fisher State Historic Site"
CSS Neuse/Caswell Historic Site (CSSN)	"CSS Neuse State Historic Site"
Pettigrew State Park (LPC)	"Pettigrew State Park"
Jockeys Ridge State Park (USSH)	"Jockeys Ridge State Park"
NC Maritime Museum, Beaufort (QAR)	"North Carolina Maritime Museum, Beaufort"
Graveyard of the Atlantic Museum (GBW)	"Graveyard of the Atlantic Museum"

TABLE 2.3. All text keywords for database searches for indicators of public interest by numbers of articles in ANHC, and for professional interest by articles in *Google Scholar*. (Table by author).

Data Sources and Collection Methods: Visiting Public Interest Indicators

Indicator data for areas and levels of North Carolina's *visiting public* interest in history, remains of the past, and UCH were collected by the author from three sources: *North Carolina Visitor Profile Reports* (NC DTFSD 2011-2014; NC VP 2015), *North Carolina General Assembly's Program Evaluation Division Report* (NC PED 2012), and *Archives and History Biennial Reports* (NC A&H 1958-2016). The Visitor Profile Reports also provided information and data on the demographics of North Carolina's visiting population.

Data Source: *Visit North Carolina* Visitor Profile Reports (NC VP)

Since 2006, the North Carolina Department of Commerce's Division of Tourism, Film and Sports Development (NC DTFSD) and from 2015 its *Visit North Carolina* group (NC VP) have contracted with a private research company to provide information on visitors to the state. This "Travels America" research program gathers information through over 10,000 internet-based interviews with people over the previous 12-months who had traveled more than 50 miles from home (excluding commuters). Additional information is collected from 4,500 to 5,500 of these travelers. Collected data are weighted to match US Census variables, size of market, household heads' age, household size and income (NC VP 2015:2). Reports describe the average North Carolina visitor by demographics, purpose of trip, activities, places visited, number of nights, and spending, and compares out-of-state and resident visitors where applicable. Visits made included to historic sites and museums. Responses to questions on places visited and activities were not mutually exclusive so percentages in reports do not equal 100 percent and categories of activities cannot be aggregated (NC VP 2015:2).

Data Source: North Carolina Program Evaluation Division Report (NC PED)

The North Carolina General Assembly's Program Evaluation Division's report on state run attractions in 2010-2011 (NC PED 2012) included numbers of visits made. State attractions reported on were managed either by the North Carolina Department of Cultural Resources (NC DCR) or by the North Carolina Department of Natural and Environmental Resources (NC DENR). To investigate how visit numbers might vary by type and by theme of site the author categorized 36 NC DCR managed history-related sites into one of seven themes: Place-Person, Regional History, Military, Maritime, Economic, Settlement, and Cultural. Each site was categorized by what seemed to the author to be its predominant theme.

Data Source: Archives and History Biennial Reports (NC A&H)

Since 1907, A&H has provided a Biennial Report of its activities to the General Assembly. These reports include data on visit numbers to history and archaeology related state attractions at least from 1960. To investigate period totals, and change over time, in *visiting public* interest in these venues' numbers of visits for biennial fiscal years from 1958/1960 to 2012/2014 were collated by the author from these reports. To investigate how numbers of visits to four particular Coastal Plain historic sites changed over time, visit numbers were also collated for: Fort Fisher (New Hanover County), Brunswick Historic Town (Brunswick County), Somerset Place Plantation (Washington County), and Historic Bath (Beaufort County). These sites were selected because: they represent key stages in North Carolina's coastal history, have been managed by A&H for many years, and have a close historical or geographical connection, or both, to the six UCH case study sites.

Data Sources and Collection Methods: Political Interest Indicators

For this study indicators for levels of *political interest* in A&H's work, UCH sites and associated state attractions (ASA) were numbers of NC Session Laws, and amounts of appropriations (recurring and non-recurring). The source for numbers of *legislations* (as NC Session Laws) was the NC State Legislature listing of Session Laws at website <https://www.ncleg.gov/Laws/SessionLaws> accessed by the author in 2017-2018. In total almost 29,000 Session Laws were listed for the period 1959/1960 to 2016/2017. Legislations relating to A&H, UCH sites, and ASAs were found by keyword searches of the NC Session Laws website.

The other indicator for levels of *political interest* was amounts of state *appropriations* (recurring (R\$) and non-recurring (NR\$)) to Archives and History and UCH sites. Data sources searched by the author for these appropriations included: *A&H Biennial Reports* (1960-2017), *North Carolina Session Laws*, *North Carolina Office of State Budget and Management Certified Budgets* (NC OSBM), *North Carolina Budgets and Governors Budgets*, and A&H/OSA site archives, and some newspaper reports. The *North Carolina Program Evaluation Division Report on State Run Attractions 2010-2011* (NC PED 2012) included gross expenditure and revenues for each state attraction open to the public during 2010-2011. From which data, the author calculated expenditure less revenue to get approximate net state appropriations for state attractions open to the public that year.

Data Sources and Collection Methods: Professional Interest Indicators

The author collected data for indicators of levels of *professional interest* in history, remains of the past, and UCH from two A&H databases: the *North Carolina Highway Historical Markers Program* (NC HHM) searched in 2011 and 2017, and North Carolina's listings on the *National Register of Historic Places* (NC NRHP) in 2015 and 2016. Data was also gathered from

A&H Biennial Reports (NC A&H 1960-2017) and from published histories of the agency including Townsend (1963; 1965a, b; 1972); Watts and Bright (1973); Wegner (2003); and Lawrence (2011). Data was also collected from the 2011 *Underwater Sites Database* (NC A&H/OSA/UAB 2011), the 2016 *Bibliography of North Carolina Underwater Archaeology* (NC A&H/OSA/UAB 2016), and from *Google Scholar* online database.

Data Source: North Carolina Highway Historical Marker (NC HHM) Program

To investigate *professional interest* generally in maritime history and places in North Carolina, the author first undertook a *critical discourse analysis* of the online essay texts for North Carolina's Highway Historical Markers. These were accessed by the author at <https://www.ncmarkers.com>. North Carolina's Highway Historical Marker Program (NC HHM) was established in 1935 (NC 1935b). Its purpose is to mark sites of statewide historical significance, commemorate people and events, provide histories of the state, and prompt further interest in the state and its history by residents and visitors (McCoy 1938; NC HHM 2018).

The NC HHM online database was searched by the author in 2011 for numbers of markers under the keyword "maritime". The results of this search were further categorized by the author under sub-themes of: *economy, fun, government, military, pirates, place* and *science*. Those with a military theme were further categorized as related to the Civil War, Revolutionary War, War of 1812, World War I, or World War II. In addition, as one of the UCH case study sites was the Native American canoes found in Lake Phelps, a search of NC HHM database was also made for the word "Indian" in the title/description text, to investigate the extent of interest in the history of these peoples as marked by the NC HHM Program in North Carolina.

Data Source: North Carolina - National Register Historic Places (NC NRHP)

In 1966, the National Historic Preservation Act (NHPA) established a National Register of Historic Places (NRHP). This is the “...nation's official list of buildings, structures, objects, sites, and districts worthy of preservation for their significance in American history, architecture, archaeology, and culture” (NC NRHP 2018a). The National Park Service (NPS) administers the Register according to Federal rules and regulations (36 CFR Part 60 and 61). At states’ level the State Historic Preservation Offices (SHPO) administer assessment of sites and recommendations for listing as made to the NPS. In North Carolina, under Administrative Code T07: 04R .0300, North Carolina’s SHPO is within A&H (NC NRHP 2018b). North Carolina General Statute (G.S. 121-12a) also provides for consideration of National Register properties in undertakings funded or licensed by the state and at state level.

By end of 2015, nationwide there were approximately 91,234 sites on the NRHP (NPS NRHP 2015). By end of 2016, for North Carolina 2,975 sites were listed (NC NRHP 2016). For this study, the 2016 listing of North Carolina historic places was copied into Excel by the author for analysis. Listed sites were then categorized by historical period, geographic location, and theme of sites to identify areas and levels of *professional interest*, since listing indicated by what criteria a place was regarded as of significance and value to the state to be on the NRHP.

Data Source: North Carolina Underwater Sites Database (NC A&H/OSA/UAB 2011)

Over almost six decades A&H staff have inventoried almost 1,000 UCH sites in North Carolina (Spencer personal communication 2016). Inventoried sites as listed in the 2011 *Underwater Sites Database* (NC A&H/OSA/UAB 2011) were used for this study. In this database information on UCH sites includes: site number, body of water, site location, environment, and date first visited. An Excel copy of the database as of 2011 was provided to the

author by OSA/UAB. From information in the database the author characterized UCH sites listed by: date of first visit, type of site, theme, geographic, and environmental location. This provided indicator data on levels of *professional interest* in UCH in general and the six UCH sites in particular.

Additional data for *professional interest* as indicated by actions (archaeological and conservation) taken for UCH sites in general and for the six UCH case study sites was collated from reports in the *Bibliography of North Carolina Underwater Archaeology* (NC A&H/OSA/UAB 2016) as well as from literature review of published articles found by keyword searches of *Google Scholar*.

Data Source: *Bibliography of North Carolina Underwater Archaeology* (NC A&H/OSA/UAB 2016)

The *North Carolina Underwater Sites Database* (NC A&H/OSA/UAB 2011) does not generally record actions (archaeological nor conservation) taken at sites. Therefore, to get an overview of actions taken for UCH sites in North Carolina's Coastal Plain Counties the author undertook a critical discourse analysis of reference titles in the *Bibliography of North Carolina Underwater Sites* (NC A&H/OSA/UAB 2016). This *Bibliography of North Carolina Underwater Archaeology* was originally compiled by Brooks et al. (2009). An updated version in Excel was provided to the author in 2016 and was used for this study (NC A&H/OSA/UAB 2016). The *Bibliography of North Carolina Underwater Archaeology* (NC A&H/OSA/UAB 2016) includes over 950 references including for reports, publications, theses, and dissertations describing actions taken for many of the UCH sites listed in the *Underwater Sites Database* (2011). The six UCH case study sites selected for this study were among those with the most

references per site listed and they also met the selection criteria for site case studies as described above.

Data Source: *Google Scholar*

Indicator data for levels of *professional interest* in UCH, the six UCH sites, and ASAs was collected by the author from keyword searches of *Google Scholar* (GS) online in April 2018. Assuming number of publications found by keyword search of *Google Scholar* for a UCH site was another indication of *professional interest* in it, data (as numbers of articles found per keyword search) was collected for the 57-year period from 1960 to 2016 by biennium. Keywords searched were as listed in Table 2.3. Citations were included but not patents. Matches found were checked to exclude those not relevant to a particular UCH site or ASA. For example, matches found for the keyword search for “Corolla” and “shipwreck” and “North Carolina” included some publications about shells - these were excluded. The keyword search on “USS *Huron*” also found publications referring to the WWII ship of the same name and these also were excluded.

Data Analyses

Data collected as described above was analyzed qualitatively and quantitatively to gain an understanding from a systems perspective of conservation management of UCH in North Carolina as undertaken by A&H, the state’s public agency tasked with implementing public policy for its underwater sites since the early 1960s (NC 1967, NC 2015). Data collected also was examined and analyzed against three public policy models to see if the nature and behavior of A&H and of the six UCH projects could be characterized as *traditional* or *complex* public management systems. These types of systems in relation to public management are described and defined from literature review in Chapter 3.

Qualitative analysis

Qualitative analysis of data collected was used to build a picture of Coastal North Carolina's geophysical, geographical, historical and demographic environment as context within which public policy for UCH has been implemented by A&H since the 1960s (as described in Chapter 5). For A&H's management of UCH generally qualitative analyses of data collected included review of the government framework (historical statutes and policies) and history of actions in relation to UCH to give a time line of key events, as described in Chapter 6 (Torre 2005:12; Rhodes 2011:42-44).

For each of the six UCH case study sites qualitative analysis, including by critical discourse analysis, was used to construct storylines for each including history, site characteristics, societal context and conservation actions taken. Site characteristics included date, type of site, location, environment, and condition. Factors that influenced conservation decisions in each case, outcomes sought and achieved were identified from archive and literature review, and by author's observation (as described in Chapter 6).

Quantitative Analyses

Quantitative analysis of data included time series analyses, inferential statistics, and multivariate analyses to investigate relationships and correlations between levels of players' interest and degrees of conservation action in each case and how these changed over time (Creswell 2009:13-14; Haynes 2008). Conservation actions and indicator data for players' interests in Archives and History, UCH, the six UCH sites, and ASAs, were quantified and analyzed to characterize the nature and behavior of the system within which policy for UCH has been implemented in North Carolina since the early 1960s. Data collected was recorded,

analyzed, and plotted in Excel, including by *frequency, period totals, and over time (biennially and decadal)*, and from the perspective of three public policy models.

Data Analyses from Perspective of Three Public Policy Models

Data was analyzed (qualitatively and quantitatively) from the perspectives of three systems models: A *Cyclical Public Policy Process Model* (Kraft and Furlong 2007:71-72), a *Dynamic Systems Model* (Dooley and Van de Ven 1999; Haynes 2008), and a *Complex Adaptive System (CAS) Model* (Rhodes et al. 2011). This was to identify whether as an organization Archives and History and the six UCH site projects could be characterized as *traditional* or *complex* systems. These two system views as approaches for public management are described and defined from literature review in Chapter 3 of this study.

Cyclical Public Policy Process Model

A *Cyclical Public Policy Process (CPPP)* model (Kraft and Furlong 2007:71-72) proposes predictable cause and effect relationships from public to political to professional levels of interest and actions taken in the formulating and implementing of public policy in public management systems (Figure 2.1). It takes a *traditional* management perspective assuming a predictable sequence of events and actions - from cause to effect. If there is sufficient public interest in an identified problem it gets onto the Government's policy agenda. With sufficient political interest legislation is enacted, policy formed, and resources provided. Professionals, including managers, in public agencies are then tasked with taking actions to implement legislation and public policy.

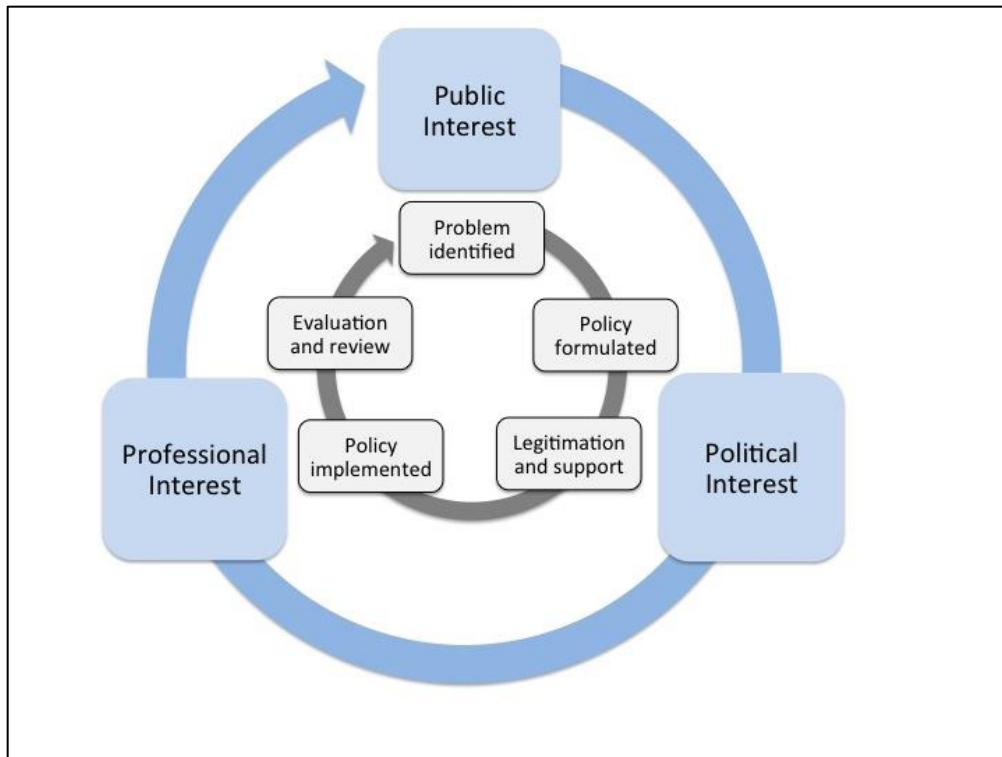


FIGURE 2.1. Cyclical Public Policy Process (CPPP) Model (Figure by author, after Kraft and Furlong (2007)).

To test the null hypothesis that there is no such predictable correlation between levels of players' interests and conservation actions taken, data collected for the six UCH sites, and ASAs, were first rank ordered. Then *Spearman Rank Correlation Coefficients* (r_s) were calculated in Excel to provide measures of strength and significance for correlations between rank ordered paired sets of indicators - players' interest data and conservation actions. Using the CORREL function r_s values were calculated for 21 paired sets of rank ordered indicators for the six UCH sites and for 15 paired sets of indicators for ASAs (Stephens 2004:215; Hauke and Kossowski 2011:89).

As a nonparametric (distribution-free) rank statistic Spearman's Rank Correlation Coefficient (r_s) can provide a measure of the strength of the monotone association between two sets of rank ordered variables (Hauke and Kossowski 2011:89). Calculation of r_s assumes "units" on which each set of two indicator variables are measured were randomly selected, and that the

probability distribution of each set of two variables are continuous. Also, that the bivariate data distribution is non-normal or data is ordinal (as in rank order numbers).

Spearman's correlation coefficient (r_s) as a statistical measure of the strength of relationship (monotonic) between each paired set of data is constrained as: $-1 \leq r_s \leq 1$. The closer r_s is to ± 1 the "stronger" the relationship. Thus, by ranges of r_s values the strength of correlations can be verbally described (Stephens 2004:215; Hauke and Kossowski 2011:89). Verbal descriptions for degrees of strength of correlations between paired sets of indicator values were substituted for r_s for the six UCH and ASAs. To test the statistical significance of the "verbal" descriptions for strength of relationship between sets of indicators, critical p values for r_s values calculated were looked up (Zar 1984). From the p values for r_s values the null hypothesis (H_0) tested was that there is no significant correlation between the pairs of ranked sets of indicator values for levels of interest in the six UCH sites or in the ASAs, or between levels of interest and conservation actions. Results of analyzing data from the perspective of this model are described in Chapter 10.

Dynamic Systems Model

Data collected for levels of players' interests in the six UCH sites was analyzed to investigate if it was possible to visually determine the nature of the system dynamics by each indicator and for each site. Data collected for levels of players' interest for each site were examined using a *complexity methodology* proposed by Haynes (2008) as based on a dynamic systems model proposed by Dooley and Van de Ven (1999). Haynes (2008) used time series plots to visually identify the type of dynamic change in a public policy system as *random*, *periodic*, *unstable* (chaotic) or *complex*.

For this study analyses of data were undertaken in four stages. First, biennial totals for each interest indicator for each UCH site and ASA were plotted versus time. Second, biennial year to year percentage change (BY2Y%) in interest indicator totals were calculated and plotted versus time. Third, BY2Y% change values were plotted as return plots (value at time t versus value at time t+1). All charts were plotted using EXCEL. These plots were then visually examined by the author with control time series and return plots for identified change patterns. These identified types of change patterns were mathematically generated for *random*, *periodic*, and *chaotic* change. For *complex* change comparison plot (and return plot) was made by the author for the control keyword “terrorist” for numbers of articles found for this keyword search in North Carolina newspapers in ANHC in 2018. By these visual comparisons with Figures 2.2, 2.3, 2.4, and 2.5, the change pattern for each set of players’ interest indicator values was identified as *periodic*, *random*, *chaotic*, or *complex*.

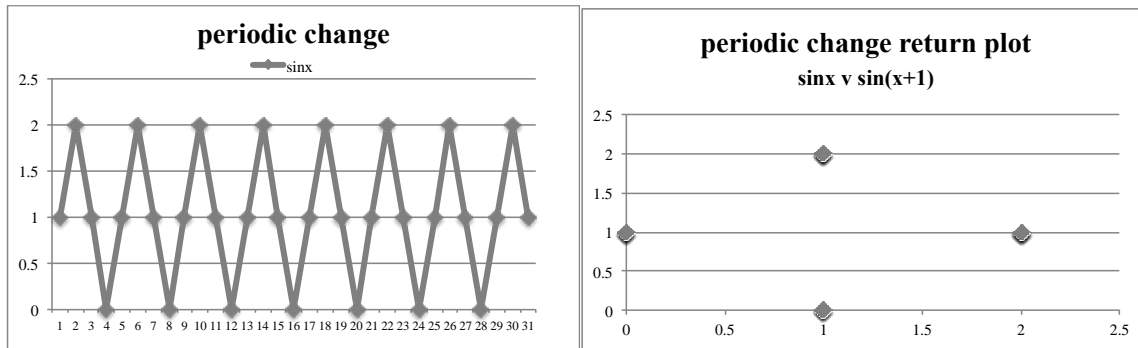


FIGURE 2.2. Periodic change pattern and return plot: Mathematically generated (in Excel) time series (left) and return plot (right) for periodic change over time for one variable. (Figure by author, data source: Kenney 2018).

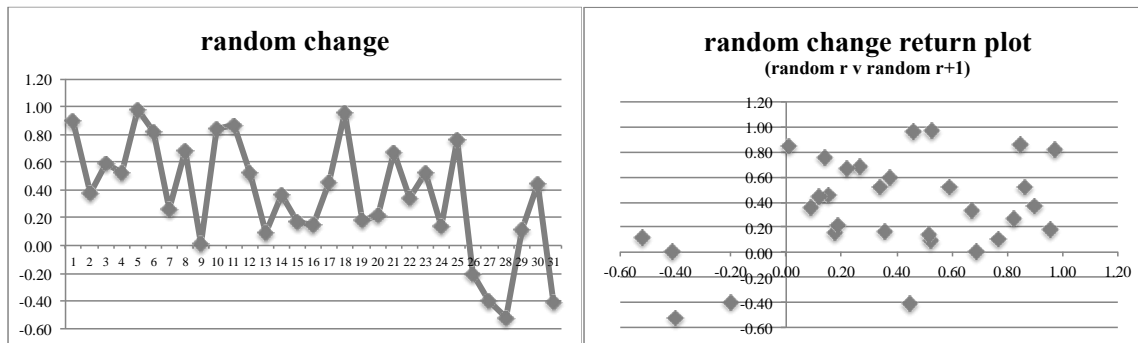


FIGURE 2.3. Random change pattern and return plot: mathematically generated (in Excel) time series (left) and return plot (right). (Figure by author, data source: Kenney 2018).

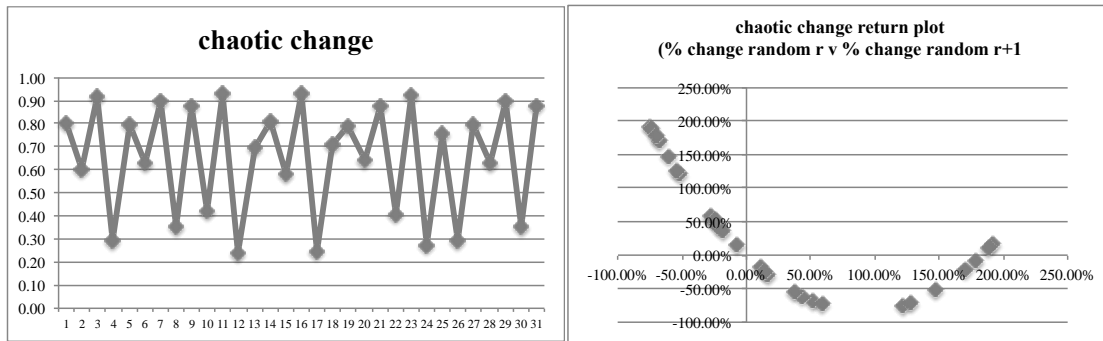


FIGURE 2.4. Chaotic change pattern and return plot: mathematically generated (in Excel using May (1976) logistics equation) time series (left) and return plot (right). (Figure by author, data source: Kenney 2018).

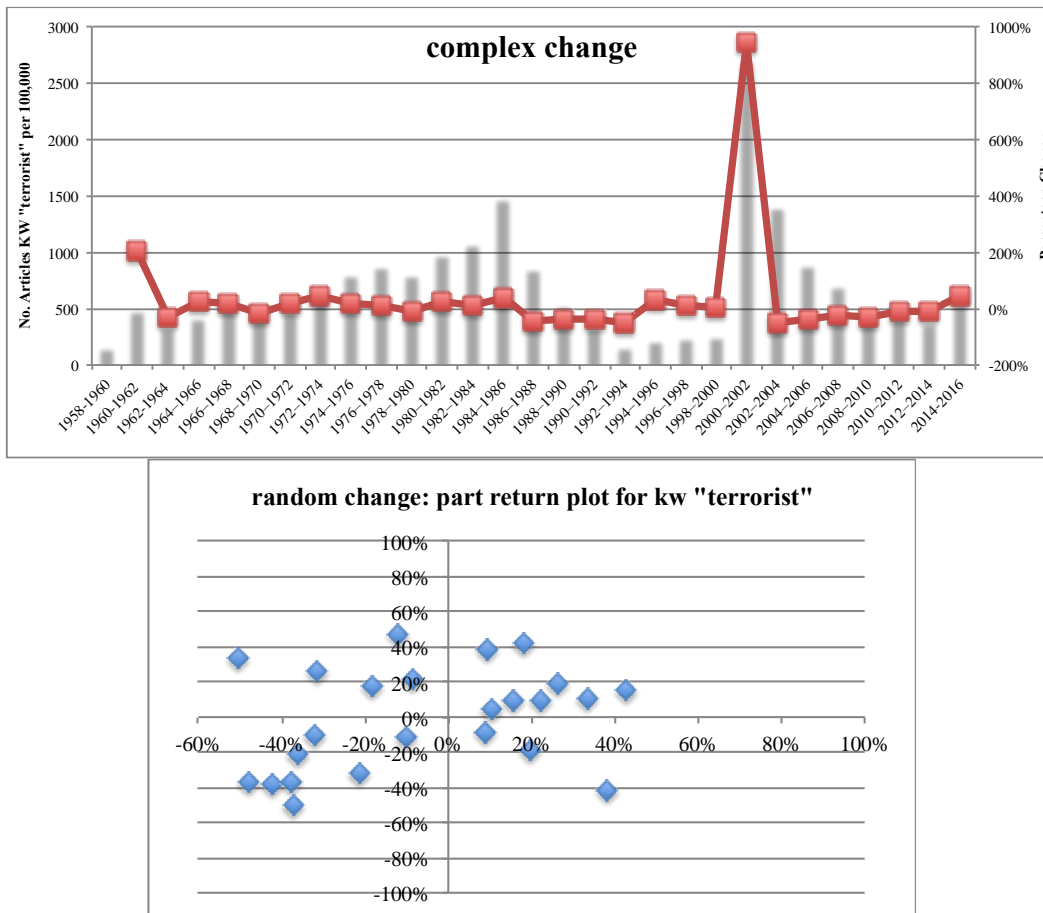


FIGURE 2.5. Complex change pattern and return plot: Time series (top) for biennial year-to-year percentage changes in number articles per 100,000 total North Carolina articles per biennial fiscal year for keyword searches in ANHC for “terrorist” (actual total n=67,822). Return plot (bottom) for period before 2000-2002. (Figure by author, data source: ANHC (2018)).

Dooley and Van de Ven (1999:364) proposed that for each type of system as visually identified from change patterns (as in Figures 2.2 – 2.5), the nature of causality in the system could be inferred by reference to a matrix model as in Table 2.6. From this matrix model two

characteristics for each dynamic change pattern can be inferred: dimensionality (as in number of variables) and nature of the interactions between them. It assumes there is a generative mechanism as a system of causal factors behind a time series pattern observed. A process theory in each case can then be proposed to explain the observations. For example, if the time series change pattern is identified as *periodic* then it could be a system with low dimensionality (few variables) and with linear interactions between those variables.

		Dimensionality of Causal System	
		Low Dimensionality (Few Variables)	High Dimensionality (Many Variables)
Nature of Interaction between Causal Factors	No Interaction or Linear Interaction	Periodic	Random
	Nonlinear Interaction	Chaotic	Complex

TABLE 2.4. Matrix model for characteristics of observed dynamics and causal systems for types of change over time. (Table by author after Dooley and Van de Ven 1999:364; Haynes 2008:406).

The *Dynamic Systems Model* proposed by Dooley and Van de Ven (1999) as applied by Haynes (2008) provided for this author’s study a means to visually identify the nature of change in relation to players’ interests and conservation actions for the six UCH sites from a dynamic systems perspective and for proposing causes for observed time series change patterns. Results are described and discussed in Chapter 10.

Complex Adaptive Systems (CAS) Model

A *complex adaptive system* (CAS) is *complex* because of its heterogeneity and diversity; *adaptive* due to its capacity to alter, change and learn from experience; and *a system* because it consists of a set of connected, interacting or interdependent things including people as agents (Grobman 2005:360). Rhodes et al. (2011) developed a “6+4” analytical framework for identifying a public project as a CAS through investigating six public urban regeneration projects and six healthcare information systems in Northern Ireland. For this study, using qualitative and

quantitative data collected the author analyzed six UCH sites through the ‘lens’ of the Rhodes et al. (2011) analytical framework to investigate if any could be characterized as a CAS. Six *elements* (*system, environment factors, environment rules, agents, processes and outcomes*) and four *behaviors* (*path-dependency, bifurcation, adaptation and emergence*) all have to be demonstrated for a public project to be a CAS (Figure 2.6).

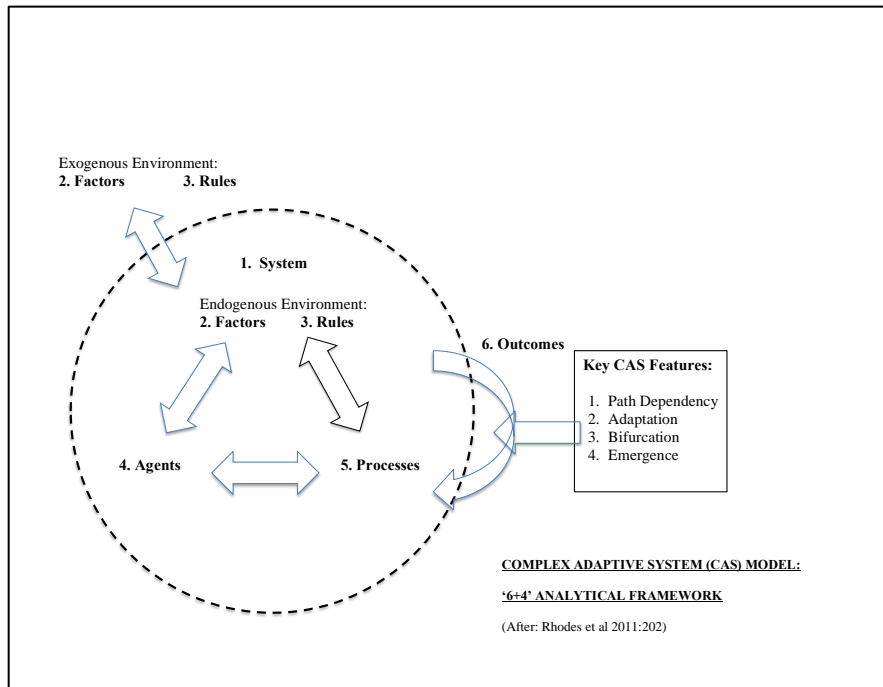


FIGURE 2.6. Complex Adaptive System Model (CAS): “6+4 Analytical Framework”. (Figure by author after Rhodes et al. 2011:202).

A public policy project as a *system* may be identified by its boundaries (physical, temporal, organizational, professional, financial, policy domain (as context), and purpose). The system’s *environment* can include anything that influences *processes* undertaken and the *outcomes* of those *processes*. *Environment* includes *factors, rules, and agents* both within the *system* (*endogenous environment*) and outside it (*exogenous environment*) (Rhodes et al. 2011:14, 117, 152).

Path-dependency refers to the behaviors, norms, values, assumptions, already characteristic of a *system* as initial conditions, which determine agents’ actions, at least at the

start of a new project. The dynamic behavior of *bifurcation* is similar to *punctuated equilibrium*; a state of semi-equilibrium is maintained until something happens with sufficient “energy” to disrupt and disorder this initial equilibrium. A new state is then adopted and a new equilibrium established (Rhodes et al. 2011:15).

Adaptation is the changes that agents make in response to actions of other participants, environmental conditions, or emergent systems. Examples of adaptation processes are: building capacity for effective stakeholder involvement, key individuals functioning as “boundary spanners” influencing and advancing projects across institutional boundaries, and establishment and recognition of the balance of power and power relationships needed to progress a project. (Rhodes et al. 2011:14, 155-158).

Emergence relates to new but unpredicted properties of a *system* created as a result of actions taken over time. Interactions between agents over time might lead to *emergence* of one of four types of vision as a driver for change. A strong vision would be consistent over time and agreed by all participants. A defensive vision would be concerned to protect professional or territory boundaries. A vision might be that of a single agent. An adaptive vision would result from negotiation and be with agreement of all participants as to how to move forward. (Rhodes et al. 2011:14, 159-160).

Data collected for A&H and its actions in relation to UCH, qualitatively and quantitatively analyzed for this study, also were examined from the perspective of Rhodes et al. (2011) analytical framework to determine if might be understood as a complex adaptive system. Results are described and discussed in Chapter 10.

Summary

This chapter described the rationales for this study's research approach, factors investigated data sources, collection methods, and data analysis methods including examination of data from the perspectives of three systems models. A mixed methods case study approach aimed to understand from a systems perspective conservation management of UCH in North Carolina by A&H. Implementation of public policy for conservation of UCH in general and for six UCH sites in particular was investigated. Factors as system variables for which data was collected and analyzed were levels of players' interest (*public, political* and *professional*), *conservation actions*, and *time*. In the following chapter, changing approaches to public management, including *traditional* and *complex* systems approaches, are defined and reviewed.

CHAPTER 3

PUBLIC MANAGEMENT: TRADITIONAL AND COMPLEX APPROACHES

“It is the object of administrative study to discover, first, what government can properly and successfully do, and secondly, how it can do these proper things with the utmost possible efficiency and at the least possible cost either of money or of energy.”
(Wilson 1887).

Introduction

In North Carolina since the 1960s, implementing public policy for UCH is a public management responsibility of the state’s public agency for A&H (NC 1967). Archives and History as a government public agency was established at the beginning of the 20th century (NC 1903). From literature review this chapter describes changing approaches to public management, including from *traditional* scientific and *complex* management systems perspectives. There is a very large corpus of published literature on public management. Over 500,000 publications were found in *Google Scholar* by the author on a keyword search for “public management” on 31 January 2019. By contrast only approximately 3,000 publications were found on a keyword search for “public management” and “complexity theory”. Of these, over 90% were published since 2000 and over 60% since 2010. There were just five publications during the decade 1980 to 1990.

Application of *complexity theory* to understanding and implementing public policy and management is identified as a new approach for the 21st century (Geyer and Rihani 2010). Publications read and referenced by the author for this chapter’s review of changing approaches to public management included particularly: Handy (1985); Haynes (2003); Kingdon (2003); Kraft and Furlong (2007); Bolman and Deal (2008); Shafritz and Hyde (2008); Rainey (2009); Geyer and Rihani (2010); Stillman (2010); Room (2011).

Public Policy, Public Agencies, Public Management, and Players

Public policy has been defined as government action, or inaction, in response to identified public problems (Kraft and Furlong 2007:5). The policy process, including how policies are adopted, implemented and evaluated, is much researched and debated. Some researchers focus on the nature and structure of public agencies as organizations to understand what works, when, and how, and to formulate generally applicable rules from particular cases (Handy 1985; Bolman and Deal 2008; Rainey 2009).

Public agencies are organizations established and owned by government. They are responsible for implementing public policy as delegated to them by government. In scope, public accountability, and political oversight, public agencies differ from private for-profit or not-for-profit organizations. Funding to implement public policy is assumed to be via appropriations from government to the agency. Unlike private for-profit organizations public agencies serve rather than sell to the public. In the USA, the Constitution, law, accountability, ethics and public interest are at the core of public management. (Appleby 1945; Olsen 2008:22; Rainey 2009:102).

Public management, also referred to in the literature as public administration, is the work of those in public agencies. The key task is execution of public law and policy. This can involve for example: enforcing rules and regulations (from neighborhood codes to immigration to protecting natural and cultural resources in coastal zones); providing protection (from police to national security to archaeological sites on land and underwater); providing services (from education to health services to parks and museums). These activities are not mutually exclusive and may be undertaken by the same agency and staff. Public agency staff may be employed as professionals, managers, or a combination of the two.

Since Woodrow Wilson (1887) first identified the need for scientific study of public administration, theorists, researchers and practitioners have sought ways to get the job done better. The challenge is to implement public policy effectively, economically and equally. Public management has become an academic and professional discipline in its own right with vast literature, a proliferation of theories, and many differing opinions on how it should be done. (Wilson 1887; Goodnow 1900; Haynes 2003; Poole and Van de Ven 2004; Kraft and Furlong 2007; Rainey 2009; Rhodes et al. 2011).

Three groups of players are involved in the public policy process of a representative democracy: the *public*, the *politicians* and the *professionals*. There is assumed to be a sequential relationship between these three groups. The public expresses its wishes to government via elected representatives. Government responds with legislation, policy, and resources, generally to address a need to control or to resolve conflict. Once approved, policy goals, regulation and practice are delegated to public organizations and agencies to manage and implement through programs and projects (Kingdon 2003; Kraft and Furlong 2007:71-87).

In public management, people are players, as *agents*, engaged in actions to achieve individual or joint objectives. Players may be individuals or represent different groups of people: *public*, *political*, *professional*, or both. Collectively organizations (including public agencies) may also be *agents* within a particular public policy context or system (Rhodes et al. 2011:13-14). Public projects may involve many players. They will have different roles and tasks, as well as possibly different and conflicting interests within a project's overall goal. Views differ as to the relative degrees of power and influence of different types of players on public policy and managing its implementation. A number of researchers, including in the heritage management field, have investigated the extent to which public managers are independent or objective players

within organizations with differing conclusions. (Gaus 1947; Firth 1996; Kaufman 2001; Poullos 2010; Rainey 2009:110-142; Stacey 2010).

Traditional Scientific Approaches to Public Management

A traditional scientific approach to public management has its roots in private sector industrial and business organizations in the first half of the 20th century, as influenced by Taylor's *Principles of Scientific Management* (1911). By this approach a manager's task was to determine, organize and standardize work so that production could be maximized for minimum cost. This required an organizational structure with a rigid hierarchy and clear distinction between roles and levels of authority (Fopp 1997:7-9; Shafritz & Hyde 2008: 36-42). The manager was an objective observer who established rules for employee behavior, and focused on motivation and performance management (Stacey 2010:40). Gulick (1937) identified seven key manager functions as: planning, organizing, staffing, directing, coordinating, reporting and budgeting.

For much of the 20th century this approach also was applied in public agencies. Weber's ideal view of a bureaucracy was first published in 1922 in Germany (Weber 1922). It provided a structural framework for such organizations to be hierarchical, rule- and expert-based authorities. Legitimacy was rooted in constitutional principles, rule of law, due process and impartial application of expertise (Shafritz and Hyde 2008:11). With such structures and principles together with the appointment and promotion of staff based on merit rather than nepotism, public organizations were regarded as essential to democracy and a defense against corruption (Olsen 2008).

This closed, hierarchical and bureaucratic approach to public management, however, began to change in the 1970s. Watergate shook public trust that government administration in the

USA was operating as Weber's ideal bureaucracy (Hecllo 1978). The actions of agency professionals as bureaucrats came to be regarded as anything but impartial or competent (Lipsky 1980). Changing the nature of public agencies to be less hierarchical and to operate with wider participatory issue and policy networks was assumed would strengthen and discipline public management. Public agencies became more open not only to amateur public involvement but also to private sector business influences and ideas. Through the 1980s and 1990s, influences and ideas from private sector business management increasingly came into the public sector, on both sides of the Atlantic. The tenet of this "New Public Management" (NPM) approach was that to implement public policy effectively required private management methods, accepting the primacy of economics and public/private partnerships. (Mosher et al. 1974; Hecllo 1978; Haynes 2003:11-12; Olsen 2008:19-20; Rainey 2009: 64; Geyer and Rihani 2010:23).

These changes brought challenges. Expanding the number and types of players could make issues more complicated and problems more difficult to resolve. Issue networks could open the door to narrowly focused, specific, interest groups more concerned to prevent a decision not consistent with their view than to reach a consensus (Hecllo 1978). In private/public partnerships the goals of each group may be diametrically opposed. Private organizations are primarily interested in profit. Public agencies are more concerned with regulation, protection and service. A too rigid NPM approach with strict adherence to artificial market boundaries could compromise accountability.

These challenges led some in the US to recommend a return to the concept of Weber's ideal bureaucracy to ensure that the constitution, law, accountability, ethics and public interest remained at the core of public management (Olsen 2008: 22). Other researchers focused on how to improve public management with a wide network of players rather than reject such networks

altogether. The challenge and task then for public managers was to lead network partners towards an identified set of shared goals whilst also ensuring equity, impartiality, accountability and ethical practice (Rethemeyer & Hatmaker 2007).

Public Management and Traditional and Complex Systems Theories

A systems perspective assumes that the nature of the system provides the key to determining its behavior. A systems approach to public management requires first identifying the boundary and scope of the system and then its component parts such as people, places, processes environment, and their behavior and interactions. System parts and interactions between them can be understood as variables affecting implementation of public policy (Haynes 2003:62).

As a system a public agency's environment (exogenous and endogenous) influences its task and ability to function. The organization's environment can include its geographical, historical, ecological, technological, legal, political, economic, demographic, and cultural contexts (Gaus 1947; Rainey 2000:89-109; Rhodes et al. 2011). In relation to its exogenous (external) environment a public agency as an organization, or parts of it, may be *closed* or *open* systems. A *closed* system is unable to change or adjust itself if the environment changes. An *open* system is able to adjust and adapt as needed to keep operating in a changing environment (Keene 1996:77). Two strands of systems theories that have influenced systems approaches to public management are *general systems theory* and *cybernetics systems theory* (Stacey 2010:40-41).

General systems theory, originating in the biological sciences, assumes the whole system is the sum of the functions of its parts and their relations and interactions within the system's overall context. The system boundary is assumed to be permeable, allowing interaction with other systems beyond. Such a system is expected to move toward a state of order, stability or

equilibrium (Stacey 2010:38-39). *Cybernetic systems theory*, originating in engineering science, focuses on systems as self-regulating and goal-oriented but also able to adapt to their environment. If a gap develops between the environment and the internal state of the system it triggers action to return the whole to a state of equilibrium. Only present conditions are relevant as triggers for adjustment to restore equilibrium (Stacey 2010:40).

Traditional Public Management Systems

Applying *general* or *cybernetic systems theory* to public management assumes that it is possible to identify the system as a whole, and the parts within it. It assumes that by studying relationships between parts as variables within the system it is possible to understand and control the activity of the whole. Dominant and discernible rules determine relations between parts and allow overall control, equilibrium, and a stable state to be established. Under given conditions rational processes lead to predictable results. What applies in one system can be generally applied to others (Haynes 2003:27-28).

A *traditional management approach* assumes the nature and behavior of system and context are stable, regular, ordered, predictable and unchanging. It is therefore possible to assume a predictable linear progression between cause and effect in relation to actions and outcomes when implementing public policy (Geyer and Rihani 2010). In a public management context, activities such as planning, budgeting, performance appraisal and quality control are examples of a *cybernetic systems* approach. In this case, a goal is identified, timescale forecast, activities, outputs and outcomes monitored, which are then compared to the goal. Adjustments are made as needed until the goal is achieved (Stacey 2010:38-39).

Through the 1990s, implementation of public policies and programs especially in education and health services were often failing despite a rigorous *traditional scientific*

management approach. This approach assumed a predictable linear progression between cause and effect in relation to actions and outcomes when implementing public policy. Some researchers and practitioners came to recognize that public management systems were in fact often unstable, irregular, changing and unpredictable. In which case different management approaches to the traditional approach would be needed to successfully implement public policy. Managers needed to understand their organization, its context and environment. In a changing environment - organization structure, working methods, and management approaches in public agencies may need also to change in order to continue to operate effectively. (Gaus 1947; Rosenhead 1998; Haynes 2003:21-28; Rainey 2009:26, 89-95; Geyer and Rihani 2010:13-16; Stacey 2010; Stillman 2010:78-79; Cairney 2012).

Public Management and Complexity Science

Complexity science originating in the physical and biological sciences covers a broad and diverse range of concepts, theories, models and metaphors. These include for describing and understanding the systemic and dynamic properties of systems. Systems or processes that lack order and stability are identified and explained despite it not being possible to assign universal rules to their behavior nor predict outcomes. Since the 1990s, researchers have investigated public management from the perspective of *complexity science* which proposes that public agencies and projects function as *complex* or *complex adaptive systems*. (Lorenz 1993; Bak et al. 1995; Geyer and Rihani 2010; Stacey 2010:56-57).

Complexity science perspectives are being applied to public management research and practice in a widening range of fields including: health services (Haynes 2008; Carlisle 2011; Cairney 2012:346; Walton 2014); marine resources including fisheries (Berkes 2006; Mahon et al. 2008); forest ecosystems (Messier et al. 2013); museum collections and documentation

systems (Cameron and Mengler 2009); archaeology (Bintliff 2006); tourism and agricultural heritage sites (Fuller and Qingwen 2013); urban heritage regeneration projects (Rhodes and Murray 2007; Rhodes 2008; Rhodes et al. 2011; Mikawi 2013); organization research (Anderson 1999; Anderson et al. 2005; Grobman 2005; Houchin and MacLean 2005; Stacey 2010); socio-ecology (Levin et al. 2012); project management (Vidal and Marle 2008; Curlee and Gordon 2011); and public policy and management generally (Mischen and Jackson 2008; Teisman and Klijn 2008; Meek 2010; Cairney 2012).

While much of the literature on *complexity* and public management is theoretical, some researchers are beginning to apply and test it in empirical research studies (Haynes 2008; Rhodes et al. 2011; Messier et al. 2013). Some researchers have identified its application to public policy and the proposition that public management contexts are not stable systems, as a Kuhnian paradigm shift for public policy management (Geyer and Rihani 2010:6). Investigation and practice of public management from the perspective of *complexity science* is still new in comparison to the body of literature in the public management field as a whole.

Complex Public Management Systems

Complexity science provides new conceptual models for investigating public management contexts as *complex systems*. Parrott and Lange (2013:17) defined a *complex system* as "...an open non-equilibrium system composed of multiple interacting components whose aggregate behavior cannot be predicted by studying the components in isolation". The whole system is more than the sum of its parts. Investigation of a *complex system* seeks to explain why and how components interact and influence the whole system. *Complex systems* have structural and dynamical properties. Structural properties include: openness, heterogeneity and diversity, and hierarchy and memory. Dynamical properties include: self-organization, emergence,

uncertainty, and adaptation. (Cilliers 2000:23-24; Cairney 2012:347-348; Parrott and Lange 2013:20).

As an *open system* there are energy or information exchanges with the external (exogenous) environment as well as between internal parts. System boundaries may be unclear or difficult to define. *Heterogeneity* and *diversity* arise from a large number of component types, with many possible, unpredictable interactions and feedback loops between them. Behavior of the whole is unpredictable from analysis of parts individually. Within a *complex system* interaction feedback loops, both direct and indirect, may be positive or negative, and operate far from equilibrium. Small actions may have large effects and vice-versa. *Hierarchy* arises from *complex systems* being aggregates of sub-systems. As past events influence its present and future state a *complex system* has *memory*. With a *diversity* of component types and interactions between them within a complex system, response to the same external stimulus are unpredictable. Unlike input-output systems, such as under the general and cybernetic systems theories, behavior of *complex systems* is not reproducible, as they do not return to the same initial state.

As a dynamical process *self-organization* is the ability of an open system to create order from disorder internally without external intervention. *Self-organization* can lead to *emergence* of new structures, processes or functions spontaneously as a natural consequence of interactions between component parts within the system. New emergent components at one level may interact with components at other levels and modify their behavior.

Complex systems have *uncertainty* due to non-linear dynamics that may be predictable statistically but are unpredictable in practice, as for example, climate and weather respectively. *Uncertainty* can arise due to it being impossible to predict the future path of a system, as it is

impossible to measure precisely its current state (stochastic processes). Deterministic chaos (where future behavior is dependent on initial conditions) can also be a source of *uncertainty* if it is not possible to measure current state precisely enough to predict the future path of the system. A third source of *uncertainty* when trying to predict the future behavior of a *complex system* is that it is likely impossible to know, let alone measure and model, all the variables in the system, or their interactions.

Examples of living *complex systems* include the human brain, the flocking behavior of birds, termites constructing colonies, and ants locating food (Stacey 2010:65). In each of these systems there are millions of agents or parts. From understanding the behavior of just one agent it is not possible to predict the behavior of the whole. Each agent may only interact with a few other agents according to local *rules*. Local interactions between agents can be both constrained and enabled by other local agents. As local connections and interactions spread across the whole population its pattern of activity emerges. From this perspective, change emerges from the bottom up, as a result of interactions between many agents at the local level. Thus in conservation management of UCH if a project was operating as a *complex system* it would not be possible to predict patterns of activity or outcomes from actions by an understanding of component parts and players separately.

Complex Adaptive Systems (CAS)

In *complex systems* the dynamical property of *adaptation* is similar to *self-organization* but is initiated in reaction to external forces and changes. Not all *complex systems* are able to adapt. Those that can are referred to as *complex adaptive systems (CAS)* (Parrot and Lange 2013:23). A CAS was defined by Grobman (2005:360) as *complex* because of its heterogeneity and diversity; *adaptive* due to its capacity to alter, change and learn from experience; and *system*

because it consists of a set of connected or interdependent things such as people or agents, molecules, and organizations. In a CAS there are a large number of parts or agents. Each may interact with some of the other agents at a local level, but without centralized direction either internally or externally. Patterns of behavior may be detectable locally but no one agent determines behavior of the whole collection or system of parts. CAS systems demonstrate self-organization in that locally, agent interaction is according to their own principles. Global patterns of behavior emerge as a consequence of local interactions between agents that may change and evolve over time (Stacey et al. 2000:106-107; Stacey 2010:64-65).

Implications of Complexity Science for Public Management

Cairney (2012:348-349) summarized *complexity science* as providing four insights for public policy and management. First, the *policy process* develops under a variety of forces some which are location or context specific. What may work in one situation will not necessarily work in another. Second, *policy systems* have self-organizing capacity and are therefore difficult to control or to predict reaction to forces. Third is the concept of a particular fitness landscape or surroundings in which people live. If it is unstable and changing, people (as agents in the system) will have to change and adapt and not necessarily rely on a single policy strategy. Finally, agents within a system may create their own views and act and behave how on they want in a particular context. Those responsible for implementing public policy will need to adapt in response to local circumstances and in response to dynamic processes. As a *complex system* a publicly managed project is not easily regulated by simple legal and managerial means as it is evolving.

Cairney (2012:353-354) in reviewing the literature on *complexity theory* and *public policy* identified three trends in translating theory into practice. First is a rejection of *traditional management* approaches, for example of rigid top-down control, and replacement with softer

more open management approaches. These included public organizations being allowed to learn and adapt in response to changing environment conditions. Informal structures such as networks and partnerships that form and dissolve in response to unpredicted change aim to facilitate access to and release knowledge, expertise, and creativity already in the organization and beyond to implement policy.

Secondly, policies when implemented may have unforeseen and unintended outcomes. These may be a consequence of internal actions or of external actions over which those responsible for implementing policy have no control. If impossible to predict outcomes, policy design and implementation should be flexible, adaptive, and adjustable. Thirdly, a greater awareness of *complexity* encourages alternative ways for evaluating policy than rigid expectations and performance measures set in advance as was required under *traditional* New Public Management approaches to public management.

Summary

For much of the 20th century, a *traditional scientific* approach to public management assumed public organizations, projects, and contexts as systems are stable, ordered, unchanging and predictable. From this perspective effective implementation of public policy would be achieved through traditional management practices in bureaucratic and hierarchical organizations using a logical analytical approach. Since the 1990s, however, researchers have demonstrated public management systems to often be unstable, unpredictable, and irregular. Under the influence of *complexity science* alternative management approaches have been proposed and are developing. These include implementing public policy through informal structures such as networks and partnerships, and constantly adapting in response to change rather than seeking

stability and control. (Rosenhead 1998; Haynes 2003, 2008; Rainey 2009:325; Stacey 2010; Rhodes et al. 2011; Geyer and Rihani 2010; Cairney 2012).

Understanding whether from a systems perspective A&H and its UCH projects in North Carolina can be characterized as *traditional* or *complex systems* should help managers in future determine appropriate conservation management approaches for implementing the state's public policy for UCH.

CHAPTER 4

COASTAL NORTH CAROLINA: PLACE AND PEOPLE

“...a spacious Tract of Land, lying betwixt the Inhabitants and the Ledges of the Mountains,
from whence our noblest Rivers have their Rise, running towards the Ocean,
where they water as pleasant a Country as any in Europe...”
(Lawson 1709:6)

Introduction

The Coastal Plain of North Carolina on the Atlantic seaboard of the United States is a place to which people for thousands of years have been and still are drawn to use its living and non-living resources. For this study *Underwater Cultural Heritage* (UCH) is defined as the physical remains of past people’s existence and activities in this place that have societal value and significance in the present. The state’s public agency for A&H is the organization that since the 1960s has responsibility for implementing public policy to conserve (preserve and protect) physical remains of the past as UCH for people in the present and future (NC 1967). Researchers investigating public management and implementation of public policy from a systems perspective have identified that understanding the environment within which a public organization or project operates is essential (Gaus 1947; Handy1985:200; Rainey 2009:89-109; Rhodes et al. 2011:116-122). This chapter therefore describes aspects of North Carolina as place (its natural coastal system) and people (their history and changing demography) as components of the exogenous environment within which A&H’s conservation management of UCH in the state takes place.

Place: The Natural Coastal System of North Carolina

A *natural coastal system* can be defined as the interactions occurring where land, sea, and air meet. North Carolina’s natural coastal system comprises ocean, barrier islands, estuaries, rivers, marshes, and swamp forests (Riggs et al. 2011:1-6). Its nature is determined by its

underlying tectonic setting, geology and continuing cyclical processes of erosion and deposition of rock and sediment under wind and wave action (Inman and Nordstrom 1971; Harris and Laws 1997; Riggs et al.1995; Stewart & Roberson 2007:3-5). By its tectonic location the coast is a “mature trailing-edge type” with low coastal forms and a wide continental shelf (Inman and Nordstrom 1971:11-12). Although geologically quiet (no volcanoes or earthquakes) it is a high-energy, and storm dependent system, characterized by environmental extremes by which it is both built and destroyed.

North Carolina is approximately 500 miles from west to east. It has three physiographic zones: Mountains, Piedmont, and Coastal Plain. The approximately 21,000 square miles of Coastal Plain extend from the ocean inland approximately 100-150 miles to the “Fall Zone” (Powell 1989:1; Stewart and Roberson 2007). Here there is a topography change from the soft sedimentary rocks of the Coastal Plain to the hard igneous and metamorphic rocks of the Piedmont. Elevations at the Fall Zone can be about 300 feet but most of the Coastal Plain is less than 20 feet above sea level. The Coastal Plain has two zones with different geometry and geologic processes divided by a “line” running northwest from Cape Lookout (Figure 4.1).

The northern coastal zone with low elevation and gentle slope is primarily a sediment-controlled system. Rivers draining from the Piedmont with weathered and unconsolidated rock have high sediment input. Deposited sediments up to 250 feet thick fill a slowly subsiding basin, the Albemarle embayment (Riggs et al. 2011:52). Long thin barrier islands north of Cape Lookout separate the Albemarle and Pamlico Sounds from the ocean. Only three inlets - Oregon, Ocracoke, and Hatteras - now connect the Albemarle-Pamlico estuary system to the ocean.

The southern coastal zone has steeper slope and a rock controlled geological framework. The Cape Fear and Lumber Rivers draining from the steeper slopes of the southern coastal zone

have lower sediment input than northern zone rivers (Riggs and Ames 2003). Barrier islands are shorter and very narrow. They are close to and sometimes hardly separated from the mainland. Eighteen inlets in addition to short-lived storm created ones connect narrow shore-parallel estuaries to the ocean (Riggs et al. 2011:6-13, 51-65).

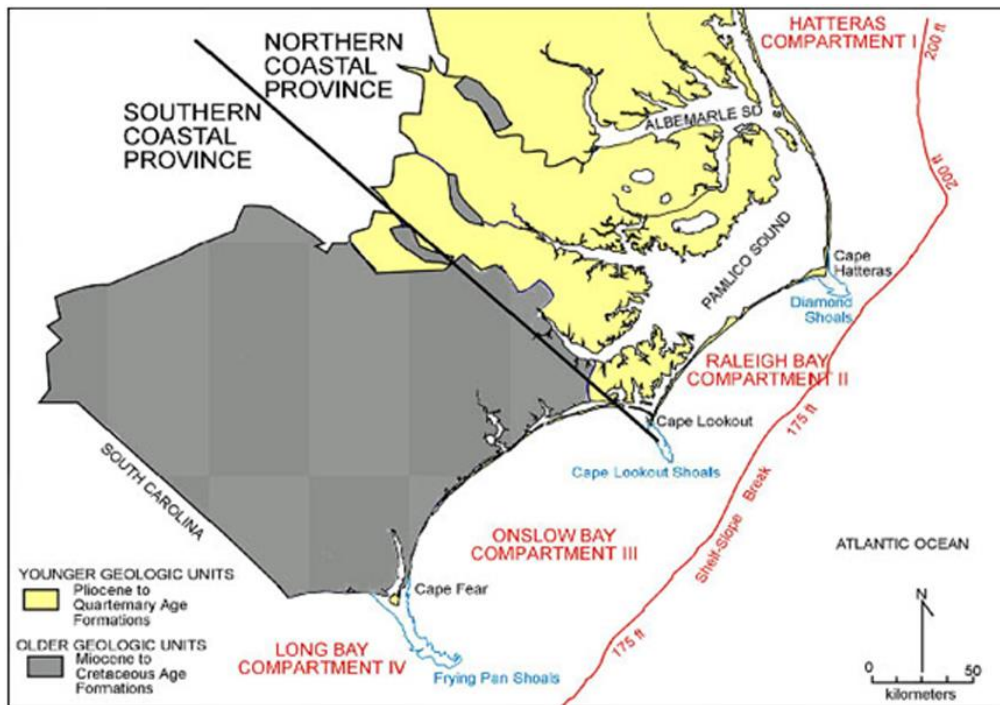


FIGURE 4.1. North Carolina's coastal geologic provinces - northern and southern zones. (Riggs and Ames 2003:21).

North Carolina's Coastal Plain is a landscape dominated by "great quantities" of water (Lawson 1709:23) and by sedimentary processes (Riggs et al. 2011). Where it is not actually underwater much of the low-lying coastal mainland is wetland with ground water levels at or just below the surface. With a warm and temperate climate and 40-50 inches of rain a year there is naturally dense vegetation cover in various wetland environments (Riggs et al. 2011:10-11). From inland to ocean shore these include longleaf pine savanna, pocosins (elevated bogs), bottomland forest, tidal freshwater marshes, cypress tree swamps, and salt marshes (Riggs and Ames 2003).

Over millions of years, rivers flowing from the mountains to the sea have created eight river basins that transport and deposit weather-eroded debris as sediments across the Coastal Plain (Harris and Laws 1997). The Cape Fear River and White Oak River systems drain into the ocean (Figure 4.2, 4.3). The Neuse and Tar-Pamlico River basins drain to the Pamlico Sound. The Roanoke, Chowan, and Pasquotank Rivers drain to the Albemarle Sound (Figure 4.2) (Meade et al. 1990:263; Riggs et al. 2008:3).

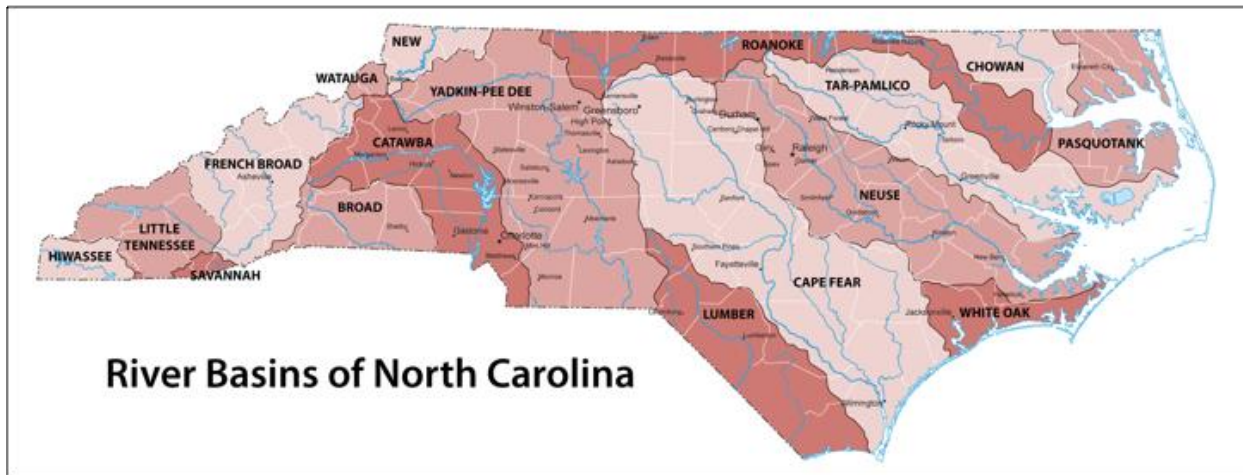


FIGURE 4.2. North Carolina river basins. (map source: <https://www.ncpedia.org/media/river-basins-north-carolina>).

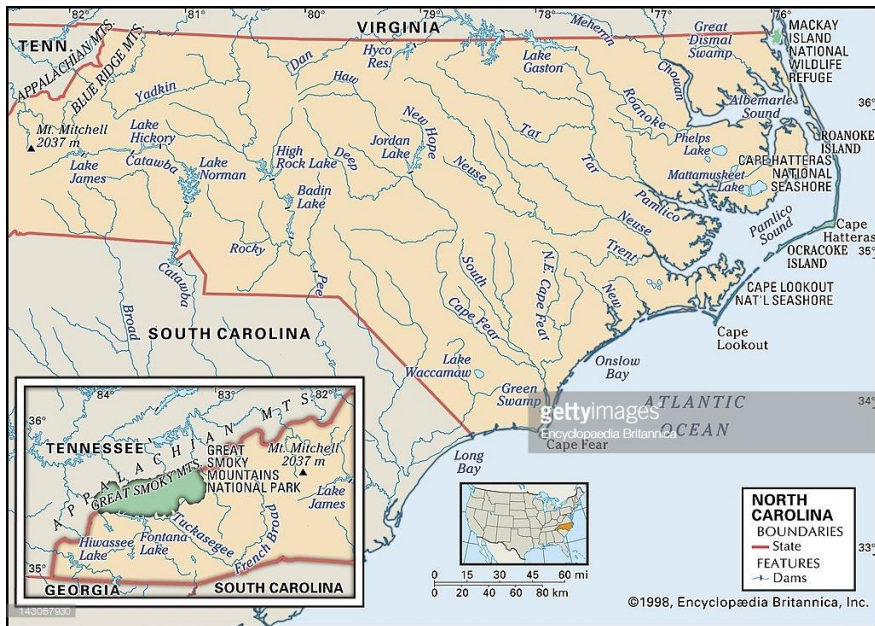


FIGURE 4.3. Major North Carolina rivers and lakes. (map source: <https://wiki--travel.com/detail/north-carolina-physical-map-26.html>).

Lakes in the Coastal Plain include the largest natural lake in North Carolina, the 30,000-acre Lake Mattamuskeet in Hyde County (Powell 2006:660) (Figure 4.3). To its north in Washington/Tyrrell County is Lake Phelps (approximately 16,600 acres) which is North Carolina's second largest natural fresh water lake (NC DEHNR 1994:1).

The location of the ocean shoreline has moved as sea level has risen and fallen. During the last ice age at the last glacial maximum approximately 18,000 years ago it was about 410 feet below today's level and variously 15 to 60 miles east of its present location. As the climate has warmed since the end of the last ice age, and sea levels have progressively risen, the ocean shoreline has migrated landward. Many parts of the prehistoric and historic landscape are now underwater, including physical remains of the earliest European settlements and probably much of the remains of the 1587 English "Lost Colony" on Roanoke Island (Powell 1989: 44; Abbott 2011; Riggs et al. 2011). As global climate continues to warm and glacial ice melts sea levels will continue to rise in North Carolina; predicted in 2011 at a rate of about 18 inches per 100 years (Riggs et al. 2011:3).

Over 300 miles of ocean shoreline currently front low-lying piles of sand forming the Outer Banks barrier islands. Between the mainland and these barrier islands are over 3,000 square miles of brackish water estuaries with some 10,000 miles of estuarine shoreline forming the Albemarle-Pamlico Estuarine System (APES) (Schoenbaum 1982; Riggs et al. 2011).

Adjacent to the ocean shoreline four coastal bay compartments - Hatteras, Raleigh Bay, Onslow Bay, Long Bay - are separated by capes and sand shoals (Figure 4.1). At the capes, extensive sediment deposition creates shallow shoals extending many miles into the ocean. As each bay has a different geographic orientation and underlying geologic framework so does its forcing agents (wind, waves, tides, and ocean currents) and sedimentary processes differ. The

south flowing cold-water Labrador Current and north flowing warm water Gulf Stream meeting at Cape Hatteras make the entire North Carolina coast prone to major storm events (Riggs et al. 2011:6-10).

People: History and Demography of North Carolina's Coastal Plain

Archaeological evidence indicates that people have been present on North Carolina's Coastal Plain for at least 12,000 years. From 10,000-8,000 years ago, native peoples travelled along inland and upland streams towards the mouths of major rivers for fishing and shell fishing (Ward and Davis 1999:73). Historic records tell of Europeans exploring and settling at least by the mid-16th century. Since that time three main groups of people in the region have been: indigenous peoples (American Indians), whites from Europe, and blacks of African descent. European settlement of the region began in earnest in the mid-17th century in the northeast of the area, around the Albemarle Sound and its rivers. Migrants came south from Virginia first in search of trade with the Indians for furs and skins and then increasingly to settle and farm from the 1650s (Powell 1989:50-53; McIlvenna 2006:18).

Despite a daunting terrain of wetlands and swamps during the 18th and 19th century's settlement spread progressively inland from the coast. Farms, towns, and ports were established close to rivers as these were the main transport routes to and from the coast for supplies and produce. Bath on the Pamlico River was established as the first town in 1705 and as a port with an assigned customs collector in 1716. Beaufort, at the entrance of what was at the time called Topsail Inlet (now Beaufort Inlet) was established in 1709. In 1722 it too became a port of entry with an official customs collector. It was a port for export of naval supplies – timber, tar, pitch and turpentine, as well as cask staves (Powell 1989:80-81).

On the Cape Fear River, the main town and port was initially Brunswick, established in 1725 on the river's west bank. It was eventually replaced by Wilmington established in about 1733 on the opposite side of the river. By 1840, Wilmington was the largest city in North Carolina as well as its key port with direct access to the Atlantic Ocean. Today, Wilmington and Morehead City (on the opposite side of Beaufort Inlet to Beaufort) are the state's ports. North Carolina's lack of good harbors with deep waters suitable for ocean going ships, however, long restricted access, settlement, trade, and development of the new state. With few inlets through the barrier islands, hundreds of miles of ocean shoreline and treacherous oceans and shoals, North Carolina's coast was especially hazardous for large ships.

Towns and ports on rivers therefore were economically and strategically very important in both peacetime and wartime. The natural coastal system has both helped and hindered its defense in times of war when control of waterways and access to beaches and ports for trade and supplies was especially critical. It was a coast impossible to totally patrol or blockade. For example, during the Civil War many blockade running ships continued to bring supplies into Confederacy strongholds via Wilmington on the Cape Fear River (Powell 1989: 8-9, 83-84, 357-358, 364-365).

At the time of first contacts with Europeans the American Indian population has been estimated at about 100,000 (Claggett 1995). In eastern North Carolina by the early 18th century, there were an estimated 4,780 in 19 nations around Bath (Lawson 1709:243). The most numerous were the Tuscarora until the Tuscarora War (1711- 1715) when many were killed, sold into slavery, or forced north to join their peoples in New York (Powell 1989:22-23,76-80; McIlvenna 2009). The first US Census in 1790 recorded North Carolina's population as either black or white, with 73 percent (288,226) white, and 27 percent (105,525) black of whom 95

percent were enslaved (Powell 1989:572). American Indians were not recorded until 1860 (<https://www.archives.gov/research/census/native-americans/1790-1930.html>).

North Carolina's population grew slowly during the Proprietary period (1663-1729) but expanded rapidly as a British Royal Colony between 1729 and 1775. In 1675, the population was about 4,000. By 1700 it had increased to 10,720, and to 35,000 by 1729 (Powell 1989:572). Starting in the late 1720s an influx of people (including English, German, Scotch-Irish, Highland Scots, and Africans) had expanded the population to about 100,000 in 1752, and by 1776 it was about 300,000 (Holland 2006:337-338). North Carolina with a recorded population of approximately 394,000 people in 1790 was the third most populous state after Virginia and Pennsylvania. By 2010, the state's total population was approximately 9.5 million, (Figure 4.4).

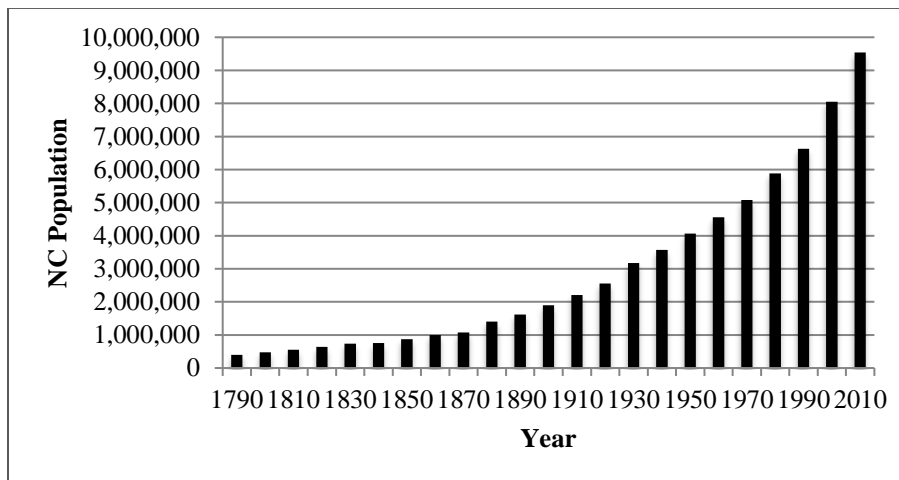


FIGURE 4.4. North Carolina population 1790-2010. (Figure by author, data source: US Censuses 1790-2010).

Through the 19th and 20th centuries, although total population increased, the rate of growth varied and even fell during some decades (Figure 4.5). Between 1820 and 1860 there was a population exodus from many parts of the state. Following the Civil War, in the 1870s there was rapid growth and by 1900, the population was just under two million. During the 1920s, the population again grew rapidly during a period of economic growth, with expansion of transport

systems and roads, and hydroelectric power. During the 1990s, the total population expanded by about 21 percent (Powell 1989; Forstall 1996; Holland 2006:337-338; US Census 1900, 2012).

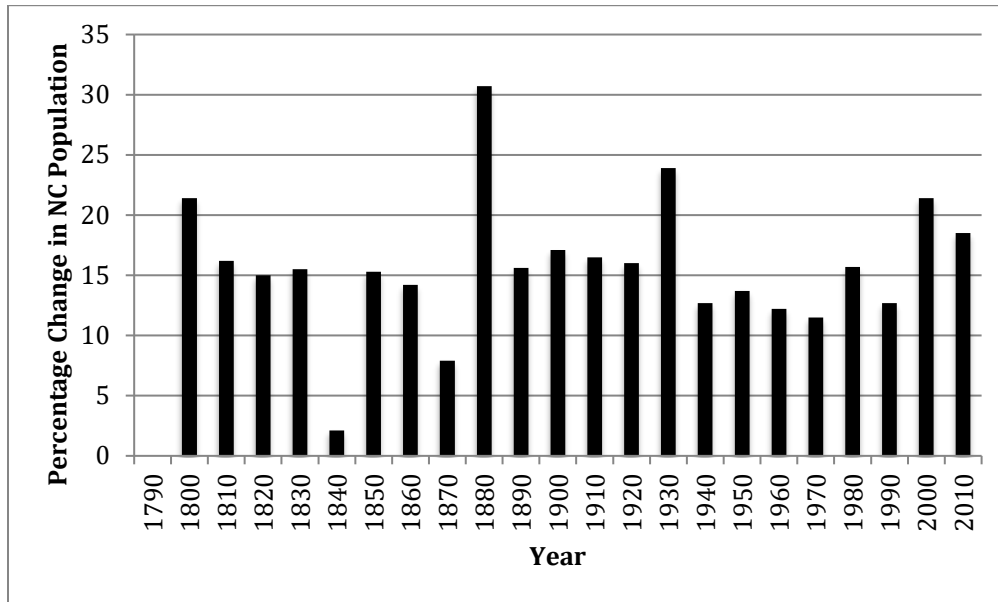


FIGURE 4.5. Percentage change in North Carolina population 1790-2010. (Figure by author, data Source: US Censuses 1790-2010).

Just as North Carolina’s total population has increased since 1900, its black and white populations have increased but their relative ratios have changed (Figure 4.6). In 1900, about a third of the population was black, in 2010 about a fifth (US Census 1900, 2012). Since 1960, American Indians have been recorded as about 1% of the state’s total population. Decade to decade percentage changes in populations by race (black and white) are plotted in Figure 4.7. The greatest decadal percentage change for whites was 1920 to 1930, and for blacks 1970 to 1980. More recent changes include an increasing Hispanic population. In 1990, it was just over 1% of the population and by 2010 over 8% (US Census 2012).

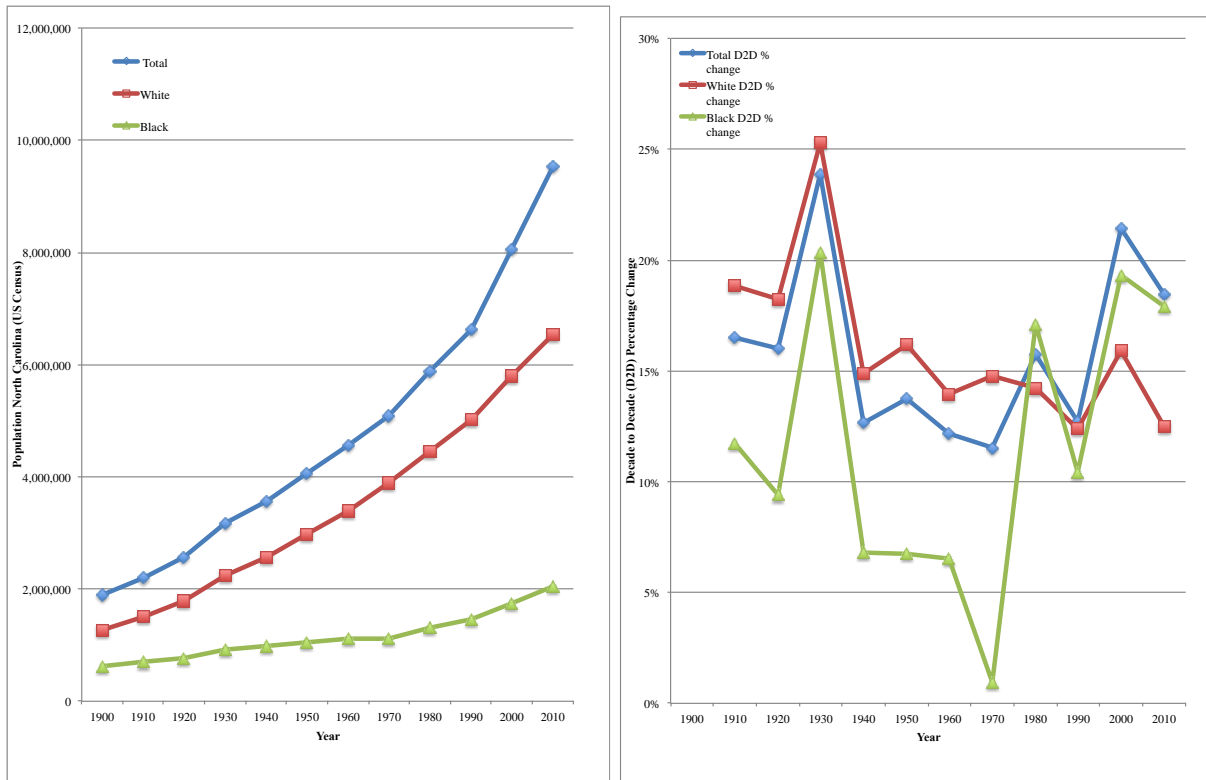


FIGURE 4.6 (left). All North Carolina population by race 1900-2010.

FIGURE 4.7 (right). Decadal percentage change in all North Carolina population by race 1900-2010.

(Figures by author, data sources: US Census 1900-2010).

Since the early 20th century there has been a continuing shift of population from *rural to urban* areas (Figures 4.8; 4.9). In 1900, approximately 10% of the population was urban, by 1960 about 40%. Since 1980 the urban population has exceeded the rural population (Figure 4.8). By 2010, about 66% of the population was urban. In 2010, the most densely populated urban areas were around the cities of Raleigh-Durham-Greensboro, Charlotte in the central Piedmont and Wilmington and Elizabeth City in the Coastal Plain. In the latter two cities, their population density was greater than 1000 people per square mile. In much of the rest of the Coastal Plain, however, population density was less than 100 people per square mile (McRory 2015:27) (Figure 4.10).

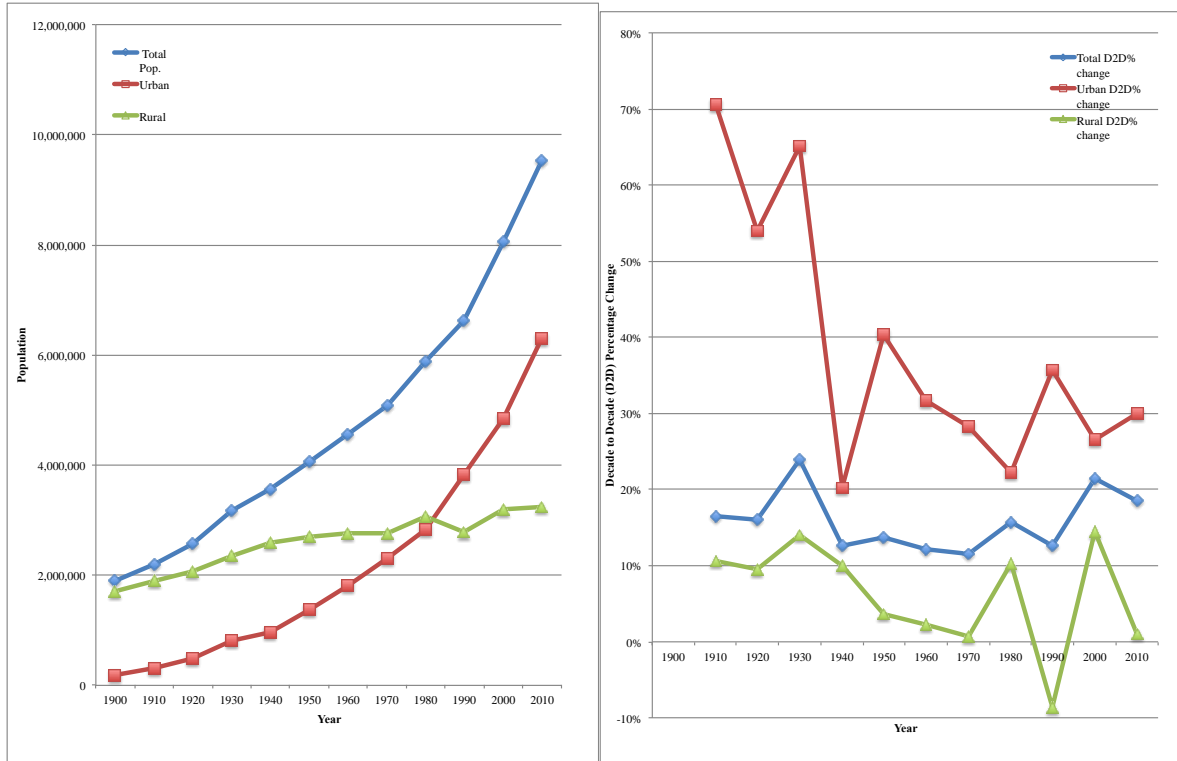


FIGURE 4.8 (left). Total, urban and rural population of North Carolina 1900-2010.
 FIGURE 4.9 (right). Decade-to-decade percentage change in total, urban and rural population of North Carolina 1900-2010. (Figures by author, data sources: US Census 1900-2010).

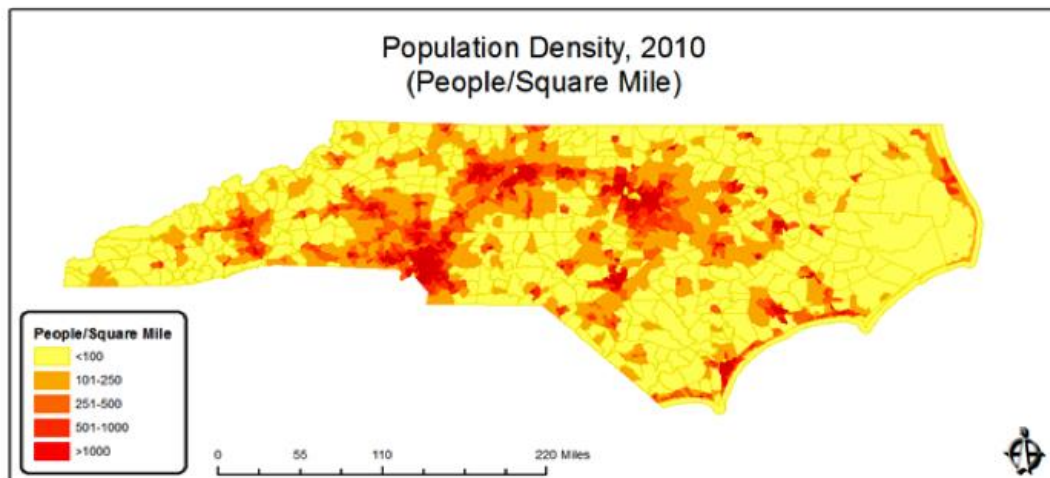


FIGURE 4.10. Population density of North Carolina in 2010 (Map source: McRory 2015:27).

In North Carolina there are now 100 administrative counties of which 41 are in the Coastal Plain (Figure 8.1). From 1950 to 2010, the total resident population of the 41 Coastal Plain counties increased from fewer than 1.4 million to over 2.7 million (Figure 4.11). As a percentage of the total state population, however, the region’s population fell from 34% to about

29%. Twenty of these Coastal Plain counties have an ocean or sound border, and are identified for this study as the “Outer Banks” or OBX counties. The other 21 inland counties are identified as the “Inner Banks” or IBX counties. The IBX counties although east of the Fall Zone have no ocean or sound border. The total population of the 21 IBX counties as a percentage of state’s total population was about 25% in 1950 but less than 20% in 2010. The total population of the 20 OBX counties, however, has remained at about 10% of the total state population (Figure 4.12).

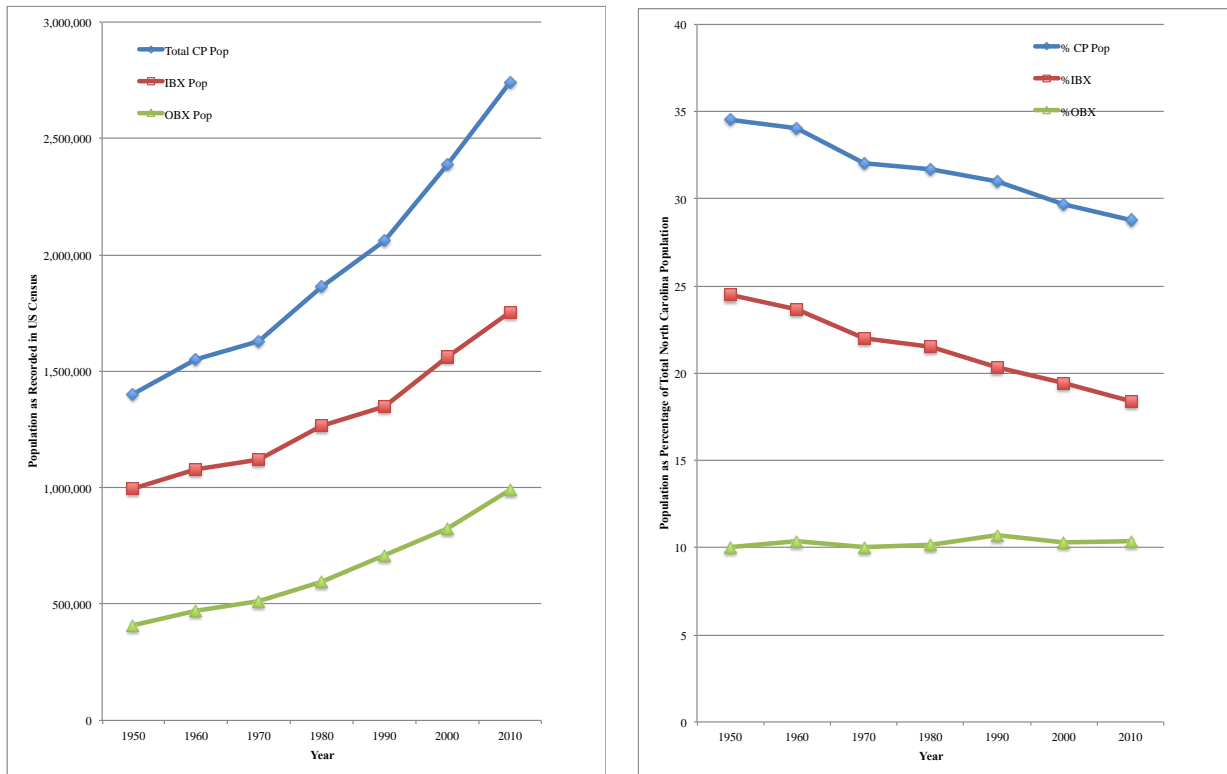


FIGURE 4.11 (left). Population of Coastal Plain counties 1950-2010.

FIGURE 4.12 (right). Population of Coastal Plain counties as percentage of total North Carolina population. (Figures by author, data sources: US Census 1950-2010).

From 1950 to 2010, the total population of OBX counties increased from less than 500,000 to 1 million. In some OBX counties resident population is increasing but in others it is decreasing. Between 2010 and 2015, resident populations grew in Brunswick, New Hanover, Pender, and Onslow counties. Other OBX counties, including Hyde, Tyrrell, Washington, Bertie, Chowan and Camden lost resident population (McRory 2015:27) (Figure 4.13). Between 1950

and 2010 New Hanover’s population increased by about 400 percent. Tyrrell’s population decreased over the same period by about ten percent. The oldest counties, settled and established before 1700, by 2010 were among the least populated, for example, Chowan, Currituck and Perquimans (Figure 4.14).

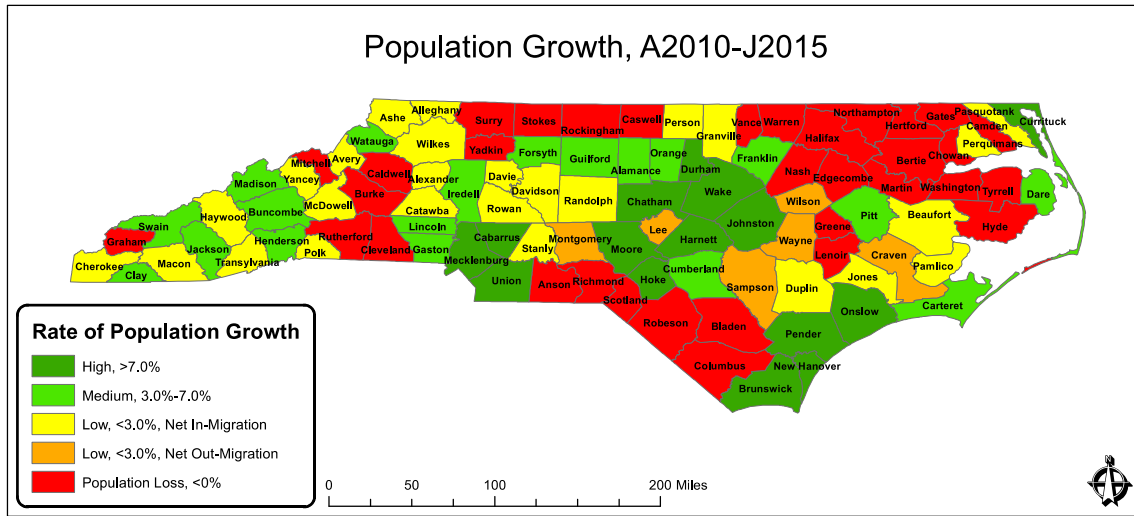


FIGURE 4.13. Population growths in North Carolina counties 2010-2015. (Map source: McRory 2015:27).

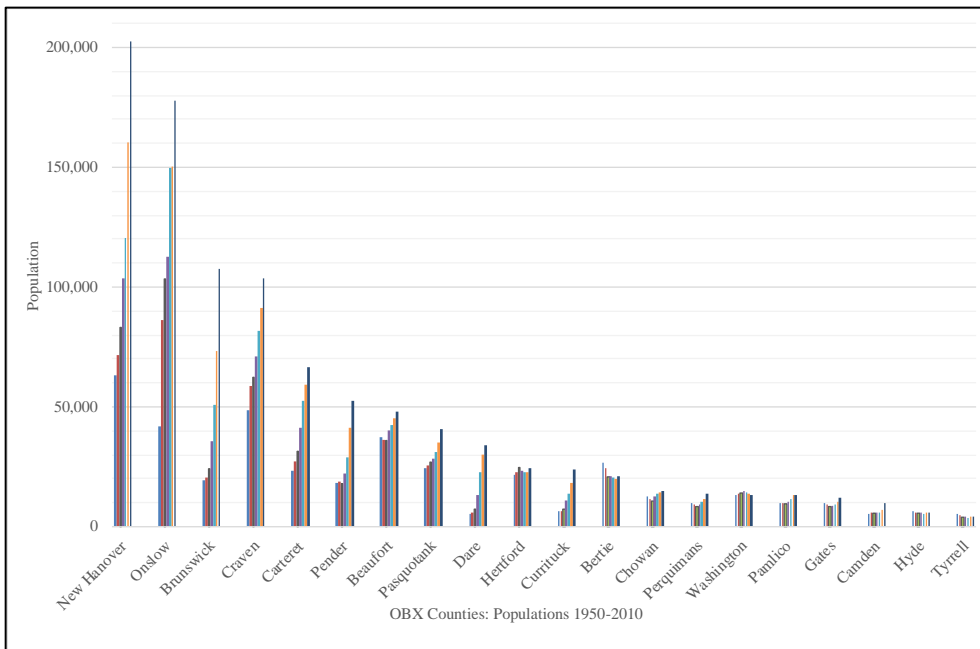


FIGURE 4.14. Populations of 20 North Carolina OBX coastal counties 1950-2010. (Figure by author, data source: US Census 1950-2010).

To investigate how resident populations of the OBX counties changed over time relative to each other the author ranked ordered the 20 OBX counties by their total populations for each census decade from 1920 to 2010 (Figure 4.15). With 20 as the highest rank order by population and one the lowest. As plotted in Figure 4.15 by rank order number over almost 100 years, Camden and Tyrrell counties ranked lowest in population most of the time. Tyrrell has had the lowest population of OBX counties for all decades since the 1920s apart from in 1940. New Hanover, has consistently ranked highest or second highest for this whole period. For other counties their rank order position increased. For example, Onslow County ranked 11 by order of its population in 1940 but was 20 in 1960. Dare County ranked 5 in 1970 but 12 by 1990. Between 1940 and 2010 Brunswick's rank order increased from 11 to 18. By contrast Bertie County ranked 17 in 1940 but had fallen to 10 by 1990 and 11 in 2010.

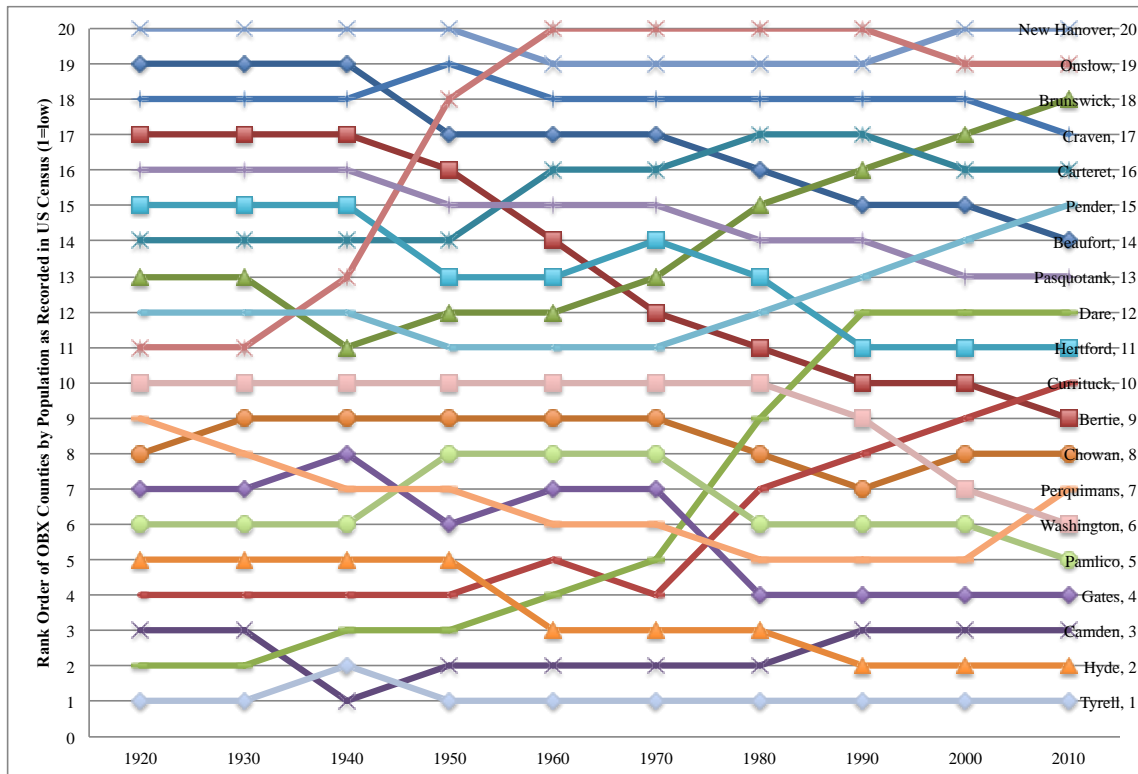


FIGURE 4.15. Rank ordering of 20 North Carolina OBX counties by population 1920-2010. (Figure by author: data source: US Census 1920-2010).

North Carolina's changing demography has also included the changing age distribution of its population. In 2000 no Coastal Plain county had more than 20 percent of the population over 65. By 2015, in eight OBX counties senior populations were over 20 percent of the county's total population (McRory 2015:30).

North Carolina's Changing Coastal Environments

The geographical environment of North Carolina's Coastal Plain has evolved over thousands of years through recursive interactions of its people with this place's natural coastal system. People's activities have enacted changes since they first settled in the area. For example, since the early 1700s, it is estimated that 50 percent of an estimated 8-10 million acres of historic wetlands have been lost, most drained for agriculture and forestry (Cashin et al. 1992). Through draining swamps and marshes for settlements, agriculture and access, previously waterlogged places have become drier including huge areas of the Great Dismal Swamp (Powell 1989).

More recently through the 20th century, increasing coastal development (buildings, hard structures such as roads and bridges, and dredging of harbors and inlets) in combination with sea level rise and climate change have led to changes in coastal sediment processes, and extensive beach erosion in many areas. Mitigation strategies using hard construction materials to prevent natural erosion and shoreward migration processes of barrier islands often only exacerbate the problems. Adding sand from other locations, as "beach nourishment" programs, is a strategy used to maintain some beaches to help sustain the state's tourist economy, as for example at Wrightsville Beach, New Hanover County, since the 1960s. (Schoenbaum 1998:236-237; Riggs et al. 2011).

With two opposing ocean currents meeting just off Cape Hatteras, the south flowing cold-water Labrador Current and north flowing warm water Gulf Stream, North Carolina's Coastal

Plain is particularly prone to major storm events (Riggs et al. 2011:24-31; Savidge et al. 2013). Nor'easters and hurricanes can bring change to the landscape suddenly and catastrophically. Change in the Coastal Plain also can be gradual and barely perceptible as under the influence of climate change and sea level rise, but “change is the only constant within the system” in timescales that can range from days to millions of years (Riggs et al. 2011:2,1-4).

In a high-energy storm dependent system as coastal North Carolina, physical parts of the maritime present can become remains of its maritime past suddenly and catastrophically. One of the earliest devastating hurricanes documented was in 1667 (McIlvenna 2006:23). Since the 1850's there have been over 93 hurricanes within 200 miles of Cape Lookout. To date the biggest to make landfall in North Carolina was Hurricane Hazel in 1954 at category 4 on the Saffir-Simpson scale (Beatley et al. 2002:38-39; Riggs et al. 2011:24-31). A Category 2 hurricane hits the coast on average about every 14 years (Smith et al. 2006). From 1950 to 2016, 24 hurricanes and 16 major storms made landfall in North Carolina (<https://climate.ncsu.edu/>).

In combination with sea level rise, storms and hurricanes cause shorelines to erode, ecosystems to migrate and disruption and loss of human settlement sites (Riggs et al. 2011:24-26; Abbott 2011). Whole communities may be destroyed and abandoned. For example, the whaling community at Diamond City on Shackleford Banks was finally abandoned following a hurricane in 1899 (Simpson and Simpson 1990:48). The Gulf Stream and Labrador Current facilitated ships sailing north and south respectively along this part of the Atlantic seaboard. Storms in combination with shifting shallows and shoals extending many miles, however, also made its coastal waters extremely hazardous for navigation. With some 5,000 known shipwrecks and abandoned vessels off its coast North Carolina's offshore waters have been labeled “Graveyard of the Atlantic” (Stick 1952; Babits 2002:119; Hoyt et al. 2014).

Once underwater, preservation of physical remains of the past such as shipwrecks can depend on the depth and rate of sediment accumulation over them (Ward et al. 1999; Gregory et al. 2012). Sediment accumulation depends on supply, which varies by location (coastal zone, river, lake, shoreline, beach and ocean). The stability of sediment once accumulated depends on the extent to which wind induced waves can be deep enough to disturb bottom sediments and any remains they may contain. During storms in North Carolina, current flow shear velocities can be sufficient for suspension and transport of fine sediments, thus reworking bottom sediments of rivers, lakes and the seabed (Wren et al. 2008:112-113; Riggs et al. 2011:29-31). For example, during Hurricane Isabel in 2003, 26 miles (43 km) off the coast at a water depth of 98 feet (30m), seabed sediments were reworked to a depth of almost three inches (7 cm) (Wren and Leonard 2005:55).

Storms may not only cause ships to wreck and destroy settlements but may also expose previously buried underwater sites and lead to their “discovery”. This was the case with three of the UCH sites selected for this study. Following a major storm in March 1962, although its location was known, the wreck of Civil War blockade-runner *Modern Greece* (1862) at the southern end of Onslow Bay was further exposed (Bright 1977:20). Following hurricane Bonnie in November 1996, at the northern end of Onslow Bay close to Beaufort Inlet an early 18th century shipwreck was partly uncovered. This wreck has been identified as *Queen Anne’s Revenge* (1718) (Wilde-Ramsing and Ewen 2012). In 2010, during storms north of Cape Lookout, at Corolla’s ocean side beach, sands were moved leading to exposure of the beach wreck referred to by A&H archaeologists as the “George Browne” Wreck (Hampton 2010a,b,c; NC A&H/OSA/UAB 2011; Brown 2013).

Summary

This chapter described the place (natural coastal system) and people (history and changing demography) of the Coastal Plain of North Carolina, as part of the exogenous environment within which the state's agency for A&H manages conservation of UCH. From literature review and analysis of US Census data it is evident that the only constant in the system is change. Change in this place can be gradual and barely perceptible as under the influence of climate change and sea level rise but in the high-energy storm dependent system of coastal North Carolina it can also be sudden and catastrophic. Coastal North Carolina is a maritime place to which for thousands of years people have been drawn for its living and non-living coastal resources. From 1950 to 2010, the population of the 41 Coastal Plain counties almost doubled but decreased as a percentage of the total state population (approximately 9.5 million) from 34 percent to about 29 percent. In some areas and counties of the Coastal Plain population has greatly increased but in others it is decreasing.

Physical remains of people's activity in the past may still survive in a range of wet burial environments, including submerged in rivers, lakes, and the ocean. Technological advances since the 1960s have enabled increasing access to underwater sites by a widening range of people with different, sometimes conflicting, interests in its use. Aside from commercial salvage, sites may have archaeological and historical value and also be a resource for entertainment, education and economic development. When an underwater site is discovered the question of what to do about it often soon arises. In the next chapter (Chapter 5) from a technical and scientific perspective five possible strategies as *conservation actions* (*conservation ex situ*, *reburial*, *active conservation in situ*, *passive conservation in situ*, and *conservation by record*) are described and discussed.

CHAPTER 5

CONSERVING UNDERWATER CULTURAL HERITAGE

Maximizing usability, achieving longevity and enhancing value for the indefinite future have been identified as goals for conserving physical remains of the past (Appelbaum 2007: xxvi-xxvii).

Introduction

This chapter from literature review and the author's experience first describes what happens to physical remains of the past in underwater environments and then options for their conservation. The extent to which remains are preserved or destroyed in a particular underwater location depends on complex and site-specific interactions between the material of the remains and their physical and biogeochemical burial environment over time. Preservation, or destruction, of remains may also depend on people's interactions with them and how they want to use them. If remains are removed from an underwater environment without appropriate conservation actions they may be destroyed rather than preserved as a result. In the second part of this chapter from a technical and scientific perspective five possible strategies as *conservation actions* (*conservation ex situ*, *reburial*, *active conservation in situ*, *passive conservation in situ*, and *conservation by record*) are described. In the third part of the chapter changing approaches to conservation of material cultural heritage are reviewed.

Remains of the Past in Underwater Environments

Physical remains of the past may survive into the present in a range of underwater environments, including submerged in rivers, lakes, and the ocean. On land, remains deposited below the water table are also in an underwater environment. As for example, in natural places such as wetlands, or in those that are artificial such as waterfronts, wells, ditches, privies, storage

pits or graves. Remains of the past may also survive underwater at the bottom of the sea, rivers, or lakes in the water column or buried under sediment, or both. In an underwater environment remains of the past may be destroyed or preserved. The effect of a particular environment on remains depends on the materials they are made of and interactions between those materials and the physical, biogeochemical nature of the environment.

UCH remains may be made of metals, organics, or inorganic materials. Metals include iron, copper, lead, silver, gold, aluminum, and their alloys. Organic materials are carbon based and derived from animals (for example, bone, leather, wool) or from plants (for example, wood and hemp). Inorganic materials include silica and carbonate-based materials such as ceramic, glass and stone. Wet environments are characterized by: water and oxygen content; hydrogen-ion concentration (pH); redox potential (Eh); presence of ion species; macro and microbial activity; temperature and salinity (Pollard et al. 2007:27-30).

In any underwater environment levels of water and oxygen are key factors determining the decay or preservation of remains. The presence of water, can lead to destruction by dissolution, hydrolysis, or electrochemical corrosion depending on the material. In an anoxic (no oxygen) waterlogged environment organic materials, may survive thousands of years, as lack of oxygen can inhibit chemical and biological degradation. If conditions do not change, a material may reach a state of equilibrium with its environment such that its rate of decay is minimal, and its condition can be described as stable. Remains discovered in underwater environments may appear to be in good condition but appearances can be deceptive. Inorganic materials can remain relatively stable and unchanged in underwater environments but organics are susceptible to biodegradation and structural change and metals to corrosion (Cronyn 1990:17-29; Björdal and Gregory 2011; Gregory et al. 2012).

Deterioration of organic materials, such as wood, in underwater environments may happen at both micro and macro levels. When found they may not be physically, chemically, or structurally sound. Wood remains are waterlogged when all the internal pore spaces are filled with water. If deterioration at a cellular level is extensive it may only be internal water that is maintaining a wood object's size and shape. In some aerobic wet marine environments, as off the coast of North Carolina in the ocean water column, at a macro-level wood remains can be completely destroyed by shipworm – *teredo navalis*. (Pearson 1987; Cronyn 1990:17-29; Jordan 2001:47; Madsen et al. 2001:37; Jones 2003; Jensen and Gregory 2006; Björdal 2012; Gregory et al. 2012).

In underwater environments all metals, apart from gold, corrode to some extent. Metal objects may corrode such that they are completely mineralized with no metal remaining. In warm marine water environments, as off the coast of North Carolina, objects (of all materials) may be found encased in concretions formed of calcium carbonate, shells, sand, and iron corrosion. (MacLeod 1982, 1996, 1998; North 1976; Pearson 1987; Hamilton 1996).

Remains of historic shipwrecks discovered in underwater environments present particular conservation challenges not only due to their size, complexity and location, but also materially as composite objects made of different materials. All of which may be in different degrees of degradation depending on site conditions. Researchers have investigated various parameters including water depth and depth of sediment, and each in relation to degradation of materials at wreck sites over time. Degree of preservation may depend on how quickly the wreck initially became covered by sediments, how long it remains covered, and to what depth. Sediments over a wreck can protect it from forces likely to cause physical damage. As sediments accumulate, aerobic biological and chemical processes become limited as oxygen supply is reduced. As depth

of burial under sediment increases the environment becomes increasingly anoxic – to a point at which biodegradation of organics and corrosion of metals can be inhibited. Corrosion rates of iron have been found also to decrease as water depth increase due to decrease in the water’s oxygen content. (Ward et al. 1999a, 1999b; MacLeod 2002, 2012; Wheeler 2002; Arnott et al. 2005; Palma 2005; McNinch et al. 2006; Björdal and Nilsson 2008).

Five categories to describe the condition of shipwrecks were defined by Muckelroy (1977, 1978) (Table 5.1). Muckelroy was the first to use statistical analysis to determine correlations between environment parameters and wreck condition; eleven environmental factors were analyzed against the five condition categories for 20 wrecks around the UK coastline. For these wrecks’ topography and nature of the seabed had most significance in relation to condition category of the wreck when discovered (Harpster 2009).

Condition Category	Description of Shipwreck Remains
1	Substantial, coherent structure.
2	Slightly less coherent and complete than class 1. Broken structural elements survive, substantial contents, range of materials and artifact types.
3	Little or no structure remains, fair amount of organic material, and wide range of artifacts – not much disturbed – thus locations retain archaeological significance.
4	No structure survives, virtually no organic material, otherwise a broad range of artifacts, seabed distribution still has archaeological significance.
5	Little survives, really smashed up by natural forces, only heavy metal and stone artifacts remain.

TABLE 5.1. Condition categories for wrecks in marine environments (Table by author after Muckelroy 1977).

When a wrecked ship sinks and comes to rest on the seabed it can disrupt normal sedimentary processes at that location by presenting an obstacle to bottom sediment transport. A number of studies have focused on sedimentation processes and wrecks, including scour and burial models by which a wreck becomes buried below or is exposed on the seabed (Caston

1979; McNinch et al. 2006; Quinn 2006; Ward et al. 1999a). Ward et al. (1999a) proposed a model for predicting deterioration following a wrecking event with rate of sediment cover and subsequent accumulation or erosion, as determining factors. The greater the depth of sediment and the more quickly it covered the wreck the better preserved it would be. Rate and degree of sedimentation would determine rates of deterioration due to biological, chemical, and physical factors.

McNinch et al. (2006:305) proposed a model by which it should be possible to predict in any marine environment the exposure or burial of wrecks on the seabed from knowledge of the currents and underlying stratigraphy. Wrecks settle into sediments until they reach a depth equal to the maximum scour level for maximum currents at the site or until they reach a geological controlling surface (Figure 5.1). This model was developed based on work at *Queen Anne's Revenge* (31CR314) wreck site in Beaufort Inlet, North Carolina.

Energy at the seabed is depth-dependent. The shallower the site the greater the likelihood that shear bed stresses will be sufficient to suspend, transport and rework sediments. At a depth at which only the strongest currents can reach as induced by hurricanes or inlet channel migration over the site, artifacts may be left exposed at depths at which normal current energies are insufficient to complete burial. If there is net erosion of sediments at a site or the wreck reaches a horizon resistant to the scour and burial process, or both, then it may be wholly or partly exposed in the water column. A wreck in the water column, unless at great depths, such as *Titanic*, or shipwrecks in the Great Lakes, would be at greater risk of destruction than if protected under sediments, due to likely physical damage from currents and greater oxygen levels. (McNinch et al. 2006; Gregory et al. 2012).

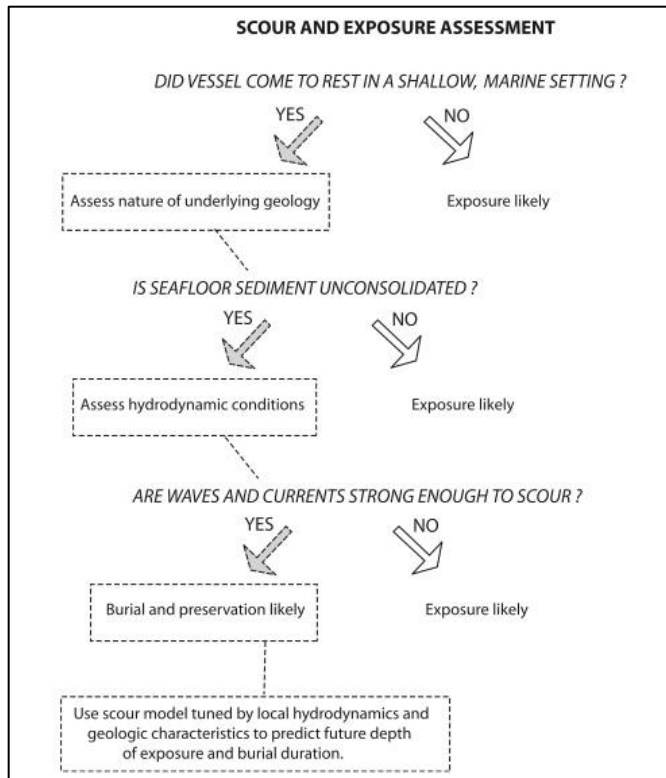


FIGURE 5.1. Assessing potential for exposure of wrecks on the seabed (McNinch et al. 2006:306).

Conservation Actions for the Preservation of UCH

Since at least the mid-19th century archaeologists, scientists and conservators have struggled to conserve remains of the past discovered in and recovered from underwater environments. Initially conservation treatments developed for archaeological finds from land sites were adapted for treatment of finds recovered from underwater sites. (Plenderleith & Werner 1971; Barkman 1977,1978; Pearson 1987; Hamilton 1996; Madsen 1994; Madsen et al. 2001; Jones 2003). Internationally through the 1990s, it became increasingly apparent that only limited resources would ever likely be available for investigation of only a small fraction of archaeological remains on land or underwater, let alone for their conservation. Other options were therefore sought to effect preservation of remains for future generations (Nixon 2004; Caple 2008). Preservation in situ came to be recommended as the first, if not the preferred option

for UCH (Manders 2008; UNESCO 2001). For this study, from literature review the author identified five possible approaches for *conservation actions* for UCH: *conservation ex situ*, *reburial*, *active conservation in situ*, *passive conservation in situ*. and *conservation by record*.

Conservation ex situ

Conservation ex situ removes a find from its underwater context and then treats it to prevent deterioration in its new context. Since the early 20th century *ex situ* conservation treatments have been applied to ship remains recovered from underwater environments with varying degrees of success, including, for example, the Oseberg Viking Ship in Norway recovered in 1904 (Rosenqvist 1959; Delgado 1997:302-303; Braovac et al. 2018) and the Roskilde Viking ships in Denmark in the 1950s (Christensen 1970). Through the 1960s and 1970s discovery and recovery of *Vasa* (1655) in Sweden, *Mary Rose* (1562) in England, and the Bremen Cog (1380) in Germany led to and still lead development of conservation methods for ship remains *ex situ*. From the 1960s, conservation treatments developed in Europe were also applied and further developed in Canada, USA, and Australia. (Pearson 1987; Hamilton 1996; Hoffman 2001; Jones 2003; Hocker et al. 2012).

In line with professional conservation ethics, standards, and guidelines, including American Institute for Conservation (AIC 2003), Institute for Conservation (ICON 2009), and International Council of Museums Conservation Committee (ICOM-CC 1984), the archaeological conservation process for finds removed from underwater environments aims to:

- Preserve them through controlling environment to minimize deterioration, loss of information and historic evidence.
- Arrest decay and stabilize them against further deterioration, through interventive treatment as necessary.

- Reveal, retrieve and preserve integrity, archaeological evidence and information.
- Restore an object to a condition in which it can be understood, studied, and could be exhibited.
- Document and record information as part of a public record archive, and disseminate findings and discoveries.

Underwater for decades, if not hundreds or even thousands of years all remains of the past will have undergone physical and chemical changes to varying degrees by the time they are discovered and recovered. Challenges for conservation of UCH ex situ include: preventing deterioration of materials on recovery; discovering the “true nature” of the find; preventing deterioration on dehydration; dealing with the water; and achieving long-term stability and accessibility. Conservation of UCH also can be a decades long process due variously to: the need to research and find appropriate treatment methods and materials; gather resources (staff, facilities, equipment); and long treatment times. Treatment for a particular artifact and how long it takes depends on: the type of artifact and material(s) it is made of condition; resources available (including number of conservators) and other project priorities. For most artifacts there are three stages to the archaeological conservation process.

Conservation Stage I (Recovery and Post-Recovery Processing) is usually completed within days of recovery. On removal of remains from an underwater environment most will need to be kept wet until treatments are completed. This is to minimize deterioration of materials due to a change in their environment on recovery from underwater. If an object dries out without conservation treatment, chemical and physical changes could potentially destroy it. These include through the actions of soluble salts (especially chlorides), oxidation of corrosion products, or collapse of structure and shrinkage of organic materials on drying. Not all materials,

require extended wet storage or complex conservation treatments. For example, ballast stones or gold objects would require virtually no treatment, beyond rinsing clean in water and air-drying. During this stage the nature the find including what it is, what it is made of, and what condition it is in will need to be identified in order to determine an appropriate treatment (Pearson 1987; Cronyn 1990; Jones 2003; Selwyn 2004; Mardikian et al. 2010:89-95; Watkins-Kenney 2014).

Conservation Stage II (Cleaning and Stabilization) can include breaking down concretions to extract encased artifacts, and further cleaning to reveal original surfaces and form. Stabilization treatments can include desalination and consolidation. These diffusion-based processes can take years depending on what an artifact is made of, its size and condition, and treatment methodology. For example, to desalinate (remove soluble salts) from a ceramic sherd from a marine environment can take about a year. To desalinate a 2000-pound cast iron cannon, can take more than five years. Although the problem of stabilizing copper alloys has been resolved since the mid-1960s with the use of the corrosion inhibitor benzotriazole (BTA) (Madsen 1967), effective conservation of archaeological iron from land or underwater sites remains an intractable problem. No universally effective chloride-removal treatment has yet been found for iron. Researchers continue to seek to characterize iron corrosion post-excavation to determine and clarify the role of chlorides, as well as how to remove or deactivate them. (Mardikian et al. 2010:92; Mardikian et al. 2011: 56-86; Watkinson et al. 2005; Watkinson et al. 2019).

Some artifacts may need to be consolidated before they can be safely dried. Wood may look in good strong condition while wet but this can be deceptive. Much of the wood's physical structure may be supported only by water at a cellular level. If allowed to dry without replacing the water with another bulking agent collapse of cell structures on loss of water can result in

irreversible shrinkage and distortion of the artifact. Various bulking agents have been used over the years, including sugar (sucrose) and silicone oils (Parrent 1985; Bright 1987; Smith 2003; Watkins-Kenney 2008). The water-soluble wax polyethylene glycol (PEG) is a preferred option for many by its reliability, ease of use, economy and repeatability (Christensen 1970:12-14; Hoffman 2001; Jones 2003; Hocker et al. 2012). Even so alternatives continue to be sought, including for re-treatment of finds such as the Oseberg ship (Christensen et al. 2012; Giachi et al. 2011; Kennedy and Penninton 2014).

Conservation Stage III (Recording and Documentation) can include, material culture analysis to confirm identification of artifacts, documentation, photography, and illustration, prior to transfer of materials to long-term storage or to museum exhibits.

Conservation ex situ is a continuous process. After treatment storage and display environments appropriate for different materials (especially for wood and iron) to minimize their deterioration will still need to be established, monitored, controlled, and maintained for the long-term. For example, given the difficulty of removing all chlorides from iron, an environment with very low relative humidity (less than 12 percent) has been found effective in preventing ongoing corrosion (Watkinson and Lewis 2005; Watkinson et al. 2005, 2019; Mardikian et al. 2010: 89-95; Williams & Peachey 2010:187-200). Conservation materials may also deteriorate over time necessitating re-treatment of the find, such as for the canoes from Lake Phelps treated with sucrose in the mid-1980s (Watkins-Kenney 2008; Gilman 2015).

Reburial

Reburial as a conservation option involves excavation, recovery, wet storage, study, and recording of finds ex situ, but then returns them to the same or similar waterlogged burial environment (Gregory 1998). Continuous monitoring of the burial environment and the remains

post-reburial should be part of the conservation strategy in line with curation of archaeological archives in repositories ex situ (Caple 2008; Godfrey et al. 2012). Two examples of this approach are 16th century Basque whaling ships in Red Bay, Canada (Waddell 2007:149-153) and finds from the *Fredericus* (1719) in Marstrand Harbor, Sweden (Godfrey et al. 2012).

In 1985, timbers from 16th century Basque whaling ships were reburied within a cofferdam constructed at the excavation site in Red Bay, Canada. The timbers were buried beneath sand, rock and silt bags. Monitoring of the site, by Parks Canada archaeologists, in 1986, 1988, and 1992, found that an anaerobic reducing environment had been achieved and preservation was presumed effective (Waddell 2007:149-153).

In 2002, approximately 9,000 finds from *Fredericus* (1719), were reburied in Marstrand Harbor, Sweden, under an international research project - RAAR Project (Reburial and Analyses of Archaeological Remains). Finds and various packing and labeling materials were buried in trenches and covered by at least 1.5 feet (50cm) of sand and clay (Godfrey et al. 2012). The project aimed to periodically uncover and examine samples of the finds until 2050. Findings so far indicate that reburial of materials in Maarstrand Harbor may be a long-term option only for large wood timbers. From examination of materials after seven years, reburial was not recommended for iron, low-fired earthenware, glass, plant fiber, or horn. Up to seven years may be considered for tanned leather, animal bone, and antler. The feasibility of longer reburial for copper alloy (bronze), medium- to high-fired ceramics, and wood was an ongoing study. Polyethylene-based packing materials, graphite pencils and permanent marker ink had survived well as reported in 2012. (Godfrey et al. 2012; Straetkvern & Williams 2012: 23-48).

Active Conservation In Situ

Active conservation in situ of UCH involves: investigating and recording the site with minimal disturbance; leaving all remains in situ following recording; initiating actions to prevent further deterioration of remains in situ; and continuing to monitor their condition and environmental parameters.

Characterization of the burial environment, including determination of threats (physical, chemical, biological and sociological) to the site and its condition should be made before taking any actions to mitigate further decay (Davies 2009: 56-57). Materials and methods of application should be tested to ensure they will not change the local chemistry at the site, its hydrological conditions, or the condition of the find. Provision for continued monitoring indefinitely should be part of an *active conservation in situ* mitigation strategy (MacLeod 2006; Caple 2008:216; Gregory et al. 2012).

Actions to conserve UCH in situ could involve artificially covering the site to provide physical protection and create an anoxic environment. Various coverings experimented with to physically protect and to promote sedimentation over sites have included: sandbags, rock, artificial sea grasses, and netting. Examples of *active conservation in situ*, are at two shipwreck sites in Australia - *William Salthouse* (Gregory et al. 2012) and *James Matthews* (Richards 2012). Corrosion rates of large iron artifacts (such as cannon, anchors, hulls) on the seabed can be reduced by cathodic protection through attachment of sacrificial anodes. For example, at the Duart Point Wreck in Scotland (MacLeod 2012), and *Queen Anne's Revenge* in North Carolina (Welsh 2010; Watkins-Kenney et al. 2015).

Passive Conservation In Situ

Passive conservation in situ can involve investigating and recording the site without disturbing it. All remains are left in situ as discovered. No additional actions are taken to protect the find or to modify the burial environment. It is hoped the natural burial environment will remain unchanged and continue to preserve the find (Manders 2008). The condition of the find and its burial environment may or may not be monitored.

There are over three million shipwrecks estimated to be on the ocean floor worldwide, as well as countless coastal settlements and landscapes that have become submerged with sea level rise since the last ice age (UNESCO 2013). The UNESCO *Convention for the Protection of Underwater Cultural Heritage* (2001) advocates *preservation in situ* be the first option considered. Given the number of underwater sites and too limited resources to do more, *passive preservation in situ* is inevitably the *conservation action* adopted for most sites. The effectiveness of this strategy, however, is not assured. It assumes an unchanging environment around remains but research and experience are demonstrating that this is rarely the case. Since the late 1990s, conservation research has expanded to characterize and monitor burial environments and determine capacity for preserving UCH in situ. Results indicate that leaving remains in situ may not be an optimum preservation strategy in the long-term. (Holden et al. 2006; Pollard et al. 2007:26-30; Ransley 2007; Caple 2008; Davies 2009; Richards and McKinnon 2009; Gregory and Matthieson 2012).

Crucial for *passive preservation in situ* at land underwater sites crucial is maintaining ground-water levels, preventing contamination, and limiting changes in oxygenation levels. In many coastal areas, however, salt intrusion as sea levels rise is changing deposition environments and higher concentrations of chlorides is likely to promote corrosion of metals.

Hydrological changes at a site may be a consequence of changes in land use, climate change, and sea-level change occurring many miles from the site (Davies 2009:15-16). For effective *preservation in situ* (active or passive) monitoring conditions not just in the immediate environment of the site but within its wider environment is essential (Holden et al. 2006:61). Examples where land use and development beyond a site have affected conditions at the site include wetland sites of Nydam Bog in Denmark (Matthieson et al. 2004; Gregory and Matthieson 2012) and Flag Fen in the UK (Powell et al. 2001). Underwater environments previously presumed to be stable and providing excellent preservation conditions for UCH are also changing with consequent acceleration of decay of finds being observed. For example, in the Baltic Sea wood-destroying shipworms are appearing as water temperatures are rising (Gregory 2010; Björdal and Gregory 2011; Straetkvern & Williams 2012: 9-14).

Researchers are also investigating rates of deterioration of remains left in situ. For example, research into the nature and rate of corrosion of the World War II battleship, *USS Arizona*, indicates that after seventy years (1941-2002) it is approximately one-fifth to one-quarter of the way toward hull structure collapse due to corrosion. This finding was taken as reassuring by the researchers and as no need to alter the site's preservation management plan – however if this corrosion rate continues the hull will collapse in about 200 years (Foecke et al. 2010). For remains in underwater freshwater or marine environments, the length of time it takes for complete loss of metal and wood, and collapse of physical integrity of hulls or artifacts will vary depending on local conditions and whether remains are in the water column, or under sediment (Gregory 2009).

Conservation by Record

Conservation by record of UCH may involve investigating, documenting and recording remains such that they continue to have a ‘virtual’ existence even if no other actions are taken and the original remains eventually disintegrate, whether they are abandoned, discarded, or lost.

Remains in situ may be recorded directly by divers at the site using traditional archaeological recording methods that include: written description, mapping, planning, sketches, scale drawings, and photography (still and video). Since the 1960s, use of marine geophysical technology has expanded options and methods for recording UCH. For example, the “recorder” may now “access” the site remotely in various ways: from a submersible; via a remotely operated vehicle (ROV); on board a research vessel; in an airplane; in a laboratory on land; or even from space. Imaging of remains in situ and ex situ can be done using sound, magnetic fields, or light (visible and structured or laser).

SONAR (sound navigation and ranging) systems use reflections of sound waves, to “see” underwater. From the strength of the return signal computers convert the sound picture into a visual one. Side scan sonar bathymetric profiles of the seabed can locate shipwrecks. Multibeam echo sounders can be used to calculate (by computer) their depth underwater. Chirp sonar, or sub-bottom profile systems, can penetrate seabed sediments to 98-131 feet (30-40m), providing images of buried objects as well as those in the water column, such as used to survey HMS *Invincible* and a Guernsey shipwreck in the UK (Baradello 2014; Plets et al. 2008). Shipwrecks located with sonar systems have included: a 2000-year-old wood shipwrecks off the coast of Turkey in the 1960s; *Mary Rose* and USS *Monitor* in the early 1970s; RMS *Titanic* in the 1980s (Klein 2002:671-677).

SONAR systems have also been used to track morphological changes at sites. For example, time-lapse single and multi-beam surveys recorded accretion/erosion cycles at sites in rivers and off the coast of Ireland (Quinn and Boland 2010). In North Carolina, investigations at state shipwreck site 31CR314 (*Queen Anne's Revenge*) used high frequency side-scan and multi-beam sonar to determine the extent of exposure of artifacts and conditions at the site following major storms and hurricanes (Wilde-Ramsing and Rodriguez 2008). Acoustic recording technology is also being developed to locate wood on the seabed and determine its condition (Arnott et al. 2005).

Since the 1960s, with the adaptation of land magnetometers for use underwater, marine magnetometers towed from research vessels on the water surface, in the water column or near the sea bottom, have been used to detect iron on the seabed, specifically shipwreck hulls and cannon (Barto and Clausen 1975; Hall 1966). Aerial magnetometer surveys also proved effective for detecting deep-water iron shipwreck and wood wrecks with iron fittings and artifacts in shallow waters as tested in Australia (Green 2014).

Natural and artificial visible light underwater is used for diver-produced records and photography. Advances in computing technologies for data collection and image processing have expanded the quality, resolution, and manipulation of images produced since the 1960s. These include transitioning from analog to digital images and photogrammetry - creating from two dimensional images, three and even four-dimensional imaging of UCH (Forte 2011). Recent computer advances are now enabling three-dimensional virtual models of wreck sites to be created from archival video surveys by re-processing images (Mertes et al. 2014).

Water depth and turbidity limit the reach of visible light underwater. LIDAR (light detecting and ranging) uses reflection of laser light pulses off objects to get images from greater

elevation or depth. Higher frequency green lasers are able to penetrate through the water column and reflect off the bottom to depths of 50 meters (Shih et al. 2014). Roman et al. (2010) used structured light, or laser systems on ROVs to produce high resolution, high fidelity and sharp images of wrecks and artifacts on the seabed at 50-400 meters in the Aegean Sea. Laser imaging systems can also be used from the air giving continuous imaging from land to sea, enabling the detection of UCH in shallow coastal water, where sonar is not useable, as for example, detecting submerged landscapes, including Roman villas, now underwater off the northern Adriatic Coast of Croatia (Doneus et al. 2013).

Laser scanning with collection of high-density point cloud data is being used to generate detailed images of shipwrecks and other objects underwater, such as at Thunder Bay Marine Sanctuary on the steamer *Monohansett* (1907) at the bottom of Lake Huron (NOAA 2014). The effectiveness of laser spectroscopy is being investigated to identify materials underwater; for example, quantitative elemental analysis of metals, and distinguishing marble from calcareous rock (Lazic et al. 2005).

These many and various underwater imaging technologies are not only expanding options for recording UCH but also providing accessibility to wider audiences, including through web sites and social media. Advances in imaging technologies are also preserving UCH by record in a “virtual world” (Watts and Knoerl 2007:223-239). In “cybernetic archaeology” virtual modeling of sites and objects is providing active and measurable space in which it is possible to interactively compare datasets, archives, models, and test hypotheses; for example, a virtual recreation of Villa Livia in Rome Italy is modeled as a complex system that can be manipulated by the user to gain an understanding of the whole as a system through time and space (Forte 2011).

As a *conservation action*, however, *conservation by record* needs to be more than just creating three-dimensional models. In Europe, the London Charter for standards in 3D modelling (Denard 2012) provides guidelines for the collection, processing, and interpretation of data to ensure three-dimensional models are rigorous scientific research tools and not just communication devices. Pletinckx (2011) advocated the need for a widely supported methodology to ensure credibility and scientific rigor, and to complement and integrate with other forms of documentation and conservation. Pletinckx proposed three requirements for achieving this. First, creation of three-dimensional documentation of remains while they still exist, including conversion of two-dimensional images for which free services are available on the Internet (for example MeshLab). Second, ensuring the creation process of three-dimensional models is documented such that different sources and projects can be evaluated, correlated and peer reviewed. Thirdly, long-term preservation of results and all sources needs to be done in a structured way. Virtual records need to be as much a part of regulated archives as objects and more conventional records are.

For *conservation by record* a number of challenges and issues still to be resolved were identified by Smith (2012). Access to the Internet is not universal. The cost of technology to view images once created can be prohibitive. Open access to virtual data may be invasive to cultural beliefs. Standards and measures for accuracy and reliability are needed. Users need to be able to distinguish what is representation of the original versus recreation of what it might have been. Outlets for peer-review of virtual projects are needed. In 2013, Elsevier launched an online journal – *Digital Applications in Archaeology and Cultural Heritage* - the first journal to publish peer reviewed three-dimensional models of cultural heritage (Smith 2012). Despite the challenges, as technologies continue to improve, and protocols, ethics and standards are

accepted, virtual methods are likely to expand use of *conservation by record* as an option for UCH.

Changing Approaches to Conservation

Traditionally material heritage conservation aims “...to prolong the life of an object by preventing, for a more or less long period of time, its natural or accidental deterioration” (Berducou 1990). The impossibility of achieving this and that change is inevitable, however, is increasingly acknowledged as part of the heritage conservation management process. English Heritage (2008:7) has defined conservation “...as the process of managing change to a significant place in its setting in ways that will best sustain its heritage values, while recognizing opportunities to reveal or reinforce those values for present and future generations”.

Conservation of material cultural heritage has become an increasingly complex and even controversial practice since the 1980s under the influence of post modernism (Poulios 2010). Other voices than just those of the professional conservator have to be considered when deciding what conservation actions to take (Demas 2002:50,34-35; Mason and Avrami 2002; Torre 2005; Appelbaum 2007; Poulios 2010; Robles 2010). In addition to managing change, heritage conservation managers need also to take into account the intangible aspects of material remains as well as the tangible (Kapelouzou 2012).

Physical remains of the past become heritage when they acquire a value. As something with value, it then needs to be protected, regulated and preserved. Conservation then is concerned not only with preserving physical remains but also with protecting its values and significance (Avrami et al. 2000). Values have been defined as positive characteristics attributed by legislation, government authorities, and other interested parties, to objects and places. Combined values determine the overall significance and reflect the importance of a find in

relation to one or more values and to other finds (Torre 2005 5:7). Principles of values-based approaches to heritage conservation are embodied in a number of international charters and organizations, as for example in Australia under ICOMOS' Burra Charter (Truscott and Young 2000). From its base in the USA the Getty Conservation Institute has also developed and promoted this approach internationally (Avrami et al. 2000; Demas 2002; Torre 2005).

At different stages of its existence (including creation, past use, loss, present and proposed future uses) UCH may have one or more types of value, including: historical, use, research, educational, monetary, associative, typological, and symbolic. A values analysis can identify critical stages in the remains' existence, condition, and associated values at each stage (Appelbaum 2007: xix-11; 120-122; Robles 2010). Comparison of current condition to ideal state can help identify realistic goals for treatment (Appelbaum (2007:66-68; 171-176). Determining values also provides a benchmark against which appropriateness of treatments can be judged and whether the project has achieved desired outcomes or not (Robles 2010).

Summary

This chapter described what happens to physical remains of the past in underwater environments and conditions under which they are either destroyed or preserved. From a technical and scientific perspective five possible strategies for the conservation of UCH were described. The third part of the chapter reviewed changing approaches to conservation of material cultural heritage. Maximizing usability, achieving longevity, enhancing value for the indefinite future, and managing change are identified goals for conserving physical remains of the past (Appelbaum 2007: xxvii; English Heritage 2008). The following chapter (Chapter 6) reports results of the author's investigation of conservation actions by A&H for North Carolina UCH sites in general and six case study sites in particular.

CHAPTER 6

IMPLEMENTING PUBLIC POLICY FOR NORTH CAROLINA'S

UNDERWATER CULTURAL HERITAGE

"It looks as if the graveyard of the Atlantic yielded one of the most exciting and historically significant discoveries ever located along our coast. The state of North Carolina is working to protect the site and will do everything we can to that end. We look forward to the day when all North Carolinians can see these exciting artifacts for themselves."
(Governor James B. Hunt 1997)

Introduction

Since 1967, when North Carolina's Legislature passed an "*Act to Establish Ownership of All Bottoms in Certain Waters and to Establish Procedures for Conducting Salvage of Abandoned Shipwrecks and other Underwater Archaeological Sites*", the state's public agency for Archives and History (A&H) has been tasked with taking actions to protect and preserve underwater sites in state waters (NC 1967). The primary research question (RQ1) for this study asked - How can conservation of UCH be managed by a public agency? Towards answering this a secondary research question (RQ2) followed with - How has UCH in North Carolina been managed by the public agency for A&H. Towards understanding this, the author investigated types of archaeological and conservation actions taken by A&H for North Carolina UCH sites. The first part of this chapter describes actions taken since the 1960s for UCH in general and for the six case study sites in particular in the second part of the chapter, in order to not only understand what was done but to also identify factors influencing actions taken.

By 2008, based on archival research the approximate locations of almost 3,000 shipwrecks off the coast were known (Figure 6.1) (Lawrence 2008). By 2016, A&H's Office of State Archaeology (OSA) Underwater Archaeology Branch (UAB) staff had inventoried and visited almost 1,000 UCH sites in state waters across the Coastal Plain (Spencer personal

communication 2016). To characterize levels and types of actions taken for the latter sites the author undertook a critical discourse analysis of the 2016 *Bibliography of North Carolina Underwater Archaeology* (NC A&H/OSA/UAB 2016) in combination with information in the *Underwater Sites Database* (NC A&H/OSA/UAB 2011). The *Sites Database* lists almost 950 inventoried and visited UCH sites across the Coastal Plain (Figure 6.2). The *Bibliography* (NC A&H/OSA/UAB 2016) includes 953 references to reports and publications for sites listed in the *Sites Database*.

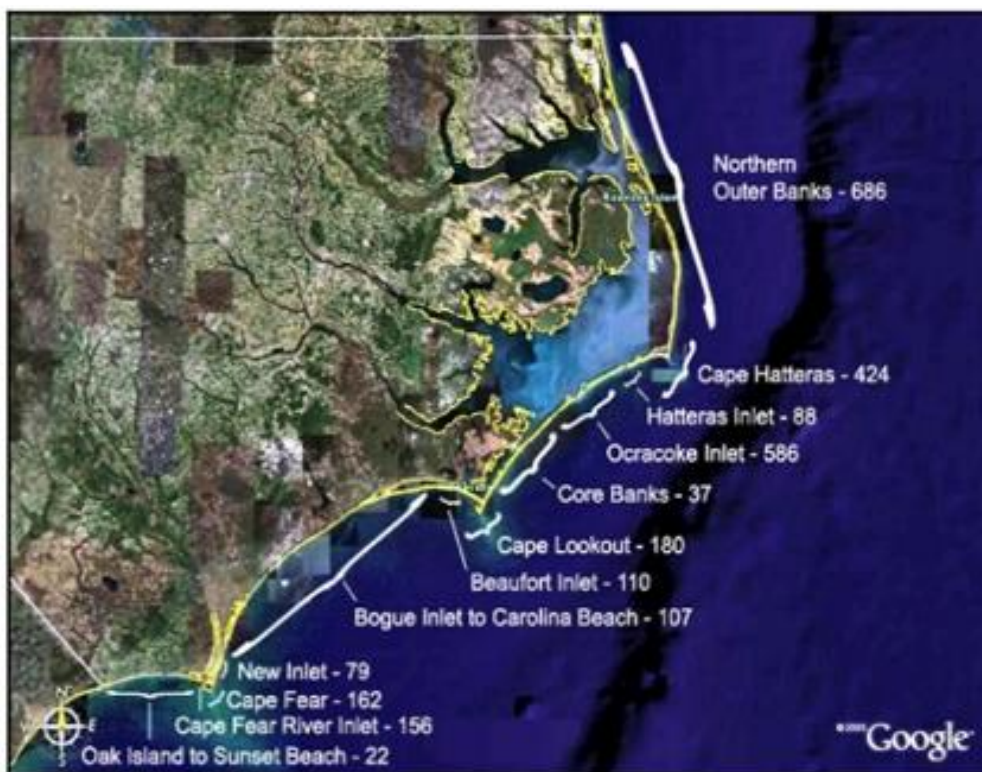


FIGURE 6.1. Location and number of known historic shipwrecks (n=2617) off coast of North Carolina (excluding vessels lost in battle or through events such as fire or explosion). (Lawrence 2008).

Of the six case study sites investigated - four were identified historic shipwrecks: *Queen Anne's Revenge* (1718), *Modern Greece* (1862), *CSS Neuse* (1865), and *USS Huron* (1871). One was an unidentified early 17th century beach wreck referred to in the 2011 *Sites Database* as the "George Browne" wreck". The sixth site was Lake Phelps in which 22 dugout log canoes with dates ranging over 4,000 years were discovered and first investigated 1985-1987 (NC

A&H/OSA/UAB 2011). The approximate locations of these sites are shown in Figure 6.2. From literature and archive review conservation storylines for these six sites were constructed from which it was possible to identify factors influencing actions taken in each case.

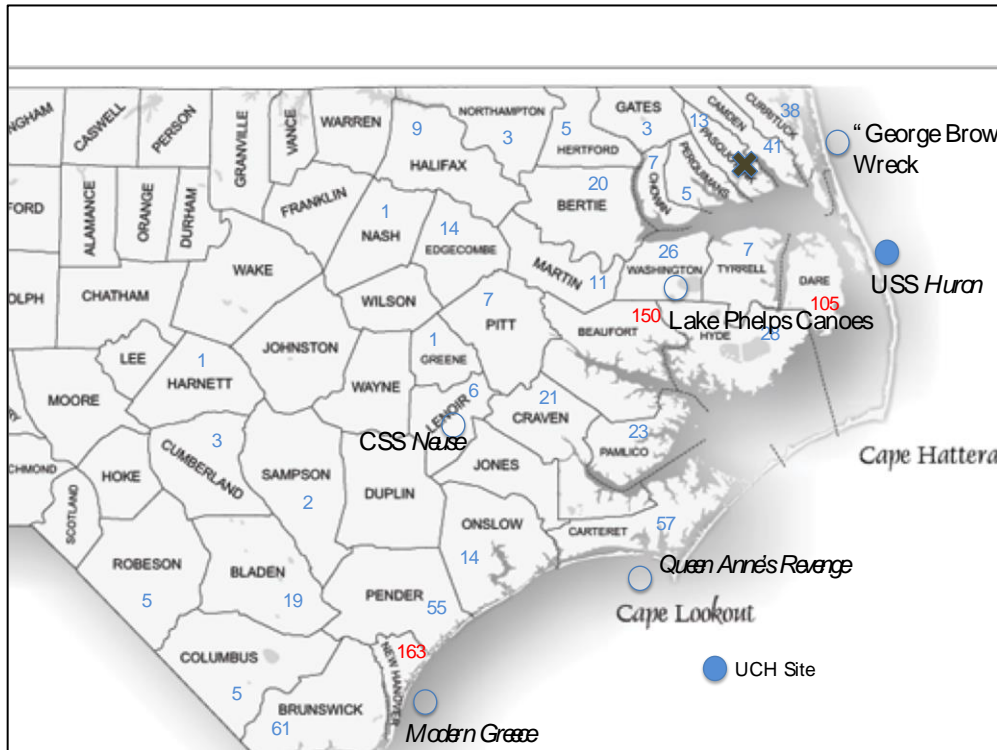


FIGURE 6.2. Distribution of UCH sites and locations of six UCH Sites in Coastal Plain counties of North Carolina as at 2011. Numbers in blue in counties are number UCH sites inventoried as at 2011. (Figure by author, data source: *Sites Database* (NC A&H/OSA/UAB 2011). County map source: https://www.ncpedia.org/sites/default/files/images/enc/map09_1g.png)

Levels of Archaeological Actions for UCH Sites in North Carolina

Three possible levels of archaeological actions defined by A&H for a UCH site in North Carolina are: Level I-Survey, Level II-Investigation, and Level III-Mitigation (Wilde-Ramsing and Lawrence 2004). The 2011 *Sites Database* did not list the level of action taken for sites. For this study therefore, the author assumed the number of references listed for a site in the 2016 *Bibliography* (NC A&H/OSA/UAB 2016) was an indication of the level of action (I, II, or III) taken; that the higher the level of action for a UCH site the greater the number of references there

would be. This assumption was used to assign levels of action (I, II, or III) to UCH sites in North Carolina's 41 coastal counties as listed in the *Sites Database* (NC A&H/OSA/UAB 2011).

Action Level I – Survey and Inventory

Action Level I - records basic information about sites as the basis of the inventory listed in the *Sites Database* (Wilde-Ramsing & Alford 1990: 25-27; Wilde-Ramsing and Lawrence 2004:6-7). Information recorded includes: identification (site number, name); date recorded; investigator and affiliation; location (body of water; geographic location); environment (water depths, currents, bottom conditions); find descriptions (for example: dimensions, prominent features, associated features, artifacts and period, propulsion, hull configuration (from typology) and materials, condition and integrity); and notes on historical research.

Action Level II – Investigation

Action Level II - information is obtained to determine whether remains have potential to contribute important data to existing knowledge and understanding of UCH sites in general, and for assessing a site's significance at local, state or national level (Wilde-Ramsing & Lawrence 2004:7-8). Investigation also aims to understand relationships of a site to its surrounding environment, and the extent to which it is threatened including by any proposed development. Investigation could involve exposing sufficient portions of a site or wreck for detailed recording and study, and collection of associated artifacts and samples for identification and analysis.

For shipwrecks, historical and community research is conducted to gather information on vessel identification, type, period of use, and date of loss or abandonment. Even if remains are threatened further work may not be recommended. As for example, when remains fit existing structural typologies but there are other better preserved and existing examples and thus remains would not add significantly to existing knowledge. Other regional maritime programs are

notified and if they are interested in the site, A&H recommends time for their recovering significant features prior to a site's destruction or disturbance (Wilde-Ramsing & Lawrence 2004:8).

Action Level III - Mitigation

Action Level III – might be recommended by A&H if: after Level I and Level II actions, a site is considered of sufficient significance to be eligible for listing on the National Register of Historic Places (NRHP); proposed disturbance to the area will so change a site's environment that its preservation might be threatened; and it is not possible for a project to change in order to avoid destruction of the UCH (Wilde Ramsing and Alford 1990:28-29). Extensive archaeological research at a site, however, can in itself be a destructive process. The A&H permitting system for Level III - Mitigation therefore requires an approved plan for research, documentation and recording that is site specific, applies accepted up-to-date archaeological methods (including conservation) for maximizing data collection, and is cost, time and energy effective (Wilde-Ramsing and Lawrence 2004 8-9).

Levels of Action Taken for UCH Sites in Coastal Counties

Of 953 North Carolina UCH sites listed in the *Sites Database* (NC A&H/OSA/UAB 2011), references were found for approximately 550 (58%) in the 2016 *Bibliography* (NC A&H/OSA/UAB 2016). Of these 42 (8%) were for UCH sites in IBX counties and 508 (63%) were for UCH sites in OBX counties (Table 6.1). Not all sites listed in the *Sites Database* could be cross-matched to references in the 2016 *Bibliography*. Although the *Sites Database* listed in total approximately 800 sites in OBX counties, approximately 300 (37%) had no references in the 2016 *Bibliography*.

Of 953 2016 *Bibliography* references, 53 (6%) were general or regional reports, 10 (1%) were land sites, and approximately 890 (93%) were UCH sites. For UCH sites in IBX counties there was just one site with four references – CSS *Neuse* (site number: NUR0001). Of sites in OBX counties that could be identified in the 2016 *Bibliography* by inventory site number 340 (67%) had just one report reference. There was one site with more than 10 references - *Queen Anne's Revenge* (site number: BUI0003) with 111 references identified.

IBX Counties				
No. references per site	Total no. Sites	Percentage of sites listed	Total no. references	Percentage of total references
1	22	52.4%	22	29.7%
2	9	21.4%	18	24.3%
3	10	23.8%	30	40.5%
4	1	2.4%	4	5.4%
>10	0	0.0%	0	0.0%
Total	42	100%	74	100.0%
OBX Counties				
No. references per site	Total no. Sites	Percentage of sites listed	Total no. references	Percentage of total references
1	340	66.9%	340	37.7%
2	92	18.1%	184	20.4%
3	54	10.6%	162	18.0%
4	8	1.6%	32	3.6%
5	6	1.2%	30	3.3%
6	7	1.4%	42	4.7%
>10	1	0.2%	111	12.3%
Total	508	100.0%	901	100.0%

TABLE 6.1 Frequency of references in 2016 *Bibliography* for UCH Sites in 2011 *Sites Database*. (Table by author, data sources: *Sites Database* (NC A&H/OSA/UAB 2011) and *Bibliography* (NC A&H/OSA/UAB 2016). [Note –As some references reported on more than one site but were counted as a separate single reference for each site it reported the total number of references in Table 6.1 is 901 references for 508 OBX UCH sites and 74 references for 42 IBX UCH sites].

For UCH sites in OBX counties as listed in the 2011 *Sites Database*, the number of references per site was used to indicate a maximum level of action for that site (Table 6.2). Thus, for sites with one or two references Level I action was inferred; three to four references - Level II; and five or more references - Level III. Of 808 sites in OBX counties 432 (53%) had one or two references per site. For these sites, Level-Survey and Inventory, was assigned as the maximum action level taken. There were 62 sites (8%) for which Level II-Investigation was assigned the maximum action level taken. In IBX counties there were nine sites with four reports

each found. In OBX counties, 14 sites (2 %) with more than five references per site were assigned to action Level III-Mitigation (Table 6.3). Level 0 action was assigned to 300 sites (37%) for which no references could be identified in the 2016 *Bibliography*.

Level of Action	No. UCH Sites OBX	Percentage
0 (0 refs/site) c. n=300	300	37%
I (1-2 refs/site) n=432	432	53%
II (3-4 refs/site) n=62	62	8%
III (> 5 refs/site)	14	2%
Total	808	100%

TABLE 6.2. Frequency of levels of action for UCH Sites (n=808) in OBX counties as listed in 2011 *Sites Database* from number of references per site found in 2016 *Bibliography*. (Table by author, data sources: *Sites Database* (NC A&H/OSA/UAB 2011) and *Bibliography* (NC A&H/OSA/UAB 2016)).

Level II Sites 4 reports in 2016 Bibliography					
County	Region	Site Number	Site Name	Body of Water	No. Reports
Beaufort	OBX	TRR0002	USS <i>Pickett</i>	Tar River	4
Brunswick	OBX	OIB0001	<i>Kincaide Wreck 9Mary E. Morris</i>	Oak Island	4
Brunswick	OBX	LFI0002	USS <i>Iron Age</i>	Lockwoods Folly Inlet	4
Carteret	OBX	SCB0003	Core Banks wreck #3	South Core Banks	4
New Hanover	OBX	NEI0006	<i>Condor</i>	New Inlet	4
New Hanover	OBX	CFR0027	<i>H.G. Wright</i>	Cape Fear River	4
New Hanover	OBX	NER0009	<i>Saltus</i>	Northeast Cape Fear River	4
Martin	IBX	ROR0009	USS <i>Otsego</i>	Roanoke River	4
Lenoir	IBX	NUR0001	CSS <i>Neuse</i>	Neuse River	4
Level III Sites > 5 reports in 2016 Bibliography					
County	Region	Site Number	Site Name	Body of Water	No. Reports
Brunswick	OBX	Various	Eagle Island	Cape Fear River	6
Brunswick	OBX	CFR0052	CSS <i>North Carolina</i>	Cape Fear River	6
Currituck	OBX	NCR0001	McKnight Shipyard wreck	North River	5
Dare	OBX	BOB0012	USS <i>Huron</i>	Bodie Island	6
New Hanover	OBX	NEI0001	<i>Modern Greece</i>	New Inlet	5
New Hanover	OBX	NER0010	Blossom Ferry East	Northeast Cape Fear River	5
New Hanover	OBX	NER0011	Blossom Ferry West	Northeast Cape Fear River	5
New Hanover	OBX	NEI0002	USS <i>Peterhoff</i>	New Inlet	5
New Hanover	OBX	NER0037	<i>Hilton Schooner</i>	Northeast Cape Fear River	6
Pamlico	OBX	NUR0018	<i>Otter Creek Wreck</i>	Neuse River	6
Washington	OBX	PHL0004	Lake Phelps Canoe #4	Lake Phelps	5
Washington	OBX	PHL0001	Lake Phelps Canoe #1	Lake Phelps	6
Washington	OBX	PHL0002	Lake Phelps Canoe #2	Lake Phelps	6
Carteret	OBX	BUI0003	<i>Queen Anne's Revenge</i>	Beaufort Inlet	129

TABLE 6.3. UCH sites in IBX and OBX counties with four or more references in 2016 *Bibliography*. (Table by author, data sources: 2011 *Sites Database* (NC A&H/OSA/UAB 2011) and 2016 *Bibliography* (NC A&H/OSA/UAB 2016)).

Types and Levels of Archaeological Actions for UCH Sites in OBX Counties North Carolina

To determine *types* of action taken at each *level* of action for UCH sites in OBX Counties, the author undertook a critical discourse analysis of references in the 2016 *Bibliography* database. Numbers of references were counted as categorized by keywords in titles, or by the nature of the work inferred from other information in the reference record. For example, theses and dissertations were categorized as “Research” – even if the word research was not used in the title. Keywords for sixteen possible types of action were identified: *survey*, *reconnaissance*, *investigation*, *inventory*, *inspection*, *field note*, *examination*, *research*, *data recovery*, *assessment*, *management*, *NRHP*, *conservation*, *recording*, *review*, and *education and outreach* (E&O).

For UCH sites in OBX counties the number of references for each keyword category, under the three different levels of action (I, II and III), were calculated as a percentage of the total number of references found for each level of action (Table 6.4; Figure 6.2):

For 432 Level I sites, the three most common types of actions, as indicated by frequency of keywords in references in the 2016 *Bibliography* were, *survey* (24%), *reconnaissance* (approximately 20 %), and *inventory* (approximately 13 %).

For 62 Level II sites, the three most common types action reported were *research* (21%), *survey* (20 %), and *investigation* (18%).

For 14 Level III sites (Table 6.3) the three most common types of action reported were *research* (37%), *investigation* (19%), and *conservation/analysis* (11%).

Level of Action:	Level I	II	III
Percentage of Total Refs/site	%	%	%
Types of Action Reported	I (n=524)	II (n=194)	III (n=183)
Survey	24.0%	20.1%	9.3%
Reconnaissance	19.7%	5.7%	2.2%
Investigation	12.6%	17.5%	18.6%
Inventory	13.4%	5.2%	0.5%
Inspection	5.9%	3.1%	3.8%
Note	6.7%	4.1%	1.1%
Examination	4.8%	0.0%	0.0%
Research	7.4%	20.6%	37.2%
Data Recovery	1.9%	16.0%	3.8%
Assessment	1.0%	3.1%	2.7%
Management	1.0%	1.0%	4.9%
NRHP	0.6%	2.1%	1.6%
Cons/Analysis	0.4%	1.5%	10.9%
Recording	0.2%	0.0%	0.0%
Review	0.2%	0.0%	1.1%
E&O*	0.4%	0.0%	2.2%
Total	100.0%	100.0%	100.0%
Total No. references/site n=	524	194	183
* Education & Outreach			

TABLE 6.4. Types of action undertaken for UCH sites in OBX counties at different levels of action. (Table by author, data sources: 2016 *Bibliography* (NC A&H/OSA/UAB 2016); 2011 *Sites Database* (NC A&H/OSA/UAB 2011)).

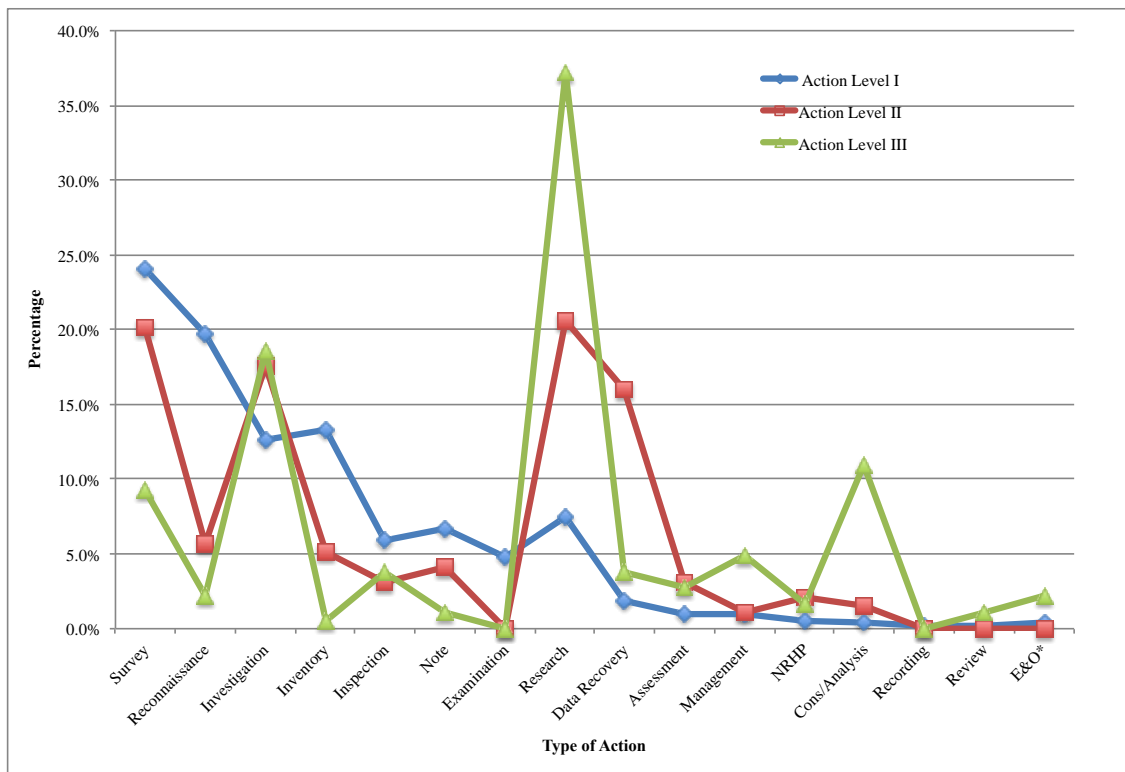


FIGURE 6.3. Types of actions undertaken for UCH sites in OBX Counties at different levels of action. (Figure by author, data sources: *Bibliography* (NC A&H/OSA/UAB 2016); *Sites Database* (NC A&H/OSA/UAB 2011)).

Levels of Action and Conservation Options for UCH Sites

From review of the conservation literature as described in Chapter 5, the author identified five possible conservation options (C) for UCH sites: C1 = preservation by record, C2 = passive preservation in situ, C3 = active preservation in situ, C4= reburial, and C5= preservation ex situ. A sixth option would be C0 = no action. These conservation options can be equated with levels of archaeological action (0, I, II, and III) as shown in Table 6.5.

	Conservation Options:	No Action	Preserve by Record	Preserve in Situ (Passive)	Preserve in Situ (Active)	Recovery & Reburial	Preserve ex Situ
Levels of Action:		C0	C1	C2	C3	C4	C5
No Action	0	★		★			
Survey and Inventory	I		★	★			
Investigation	II		★	★			★
Mitigation	III		★	★	★	★	★

TABLE 6.5. Conservation options equated with levels of archaeological action (0, I, II, and III). (Table by author).

More than one conservation option may be undertaken at each Level of Action. If there is no action (Level 0) for a known UCH site by default there is no conservation action (C0). At action Level I, survey and inventory contribute to the site’s preservation by record (C1) but if no further action is taken and the site is left undisturbed, passive preservation in situ (C2) may be presumed. At action Level II conservation options implemented are likely also C1 (preservation by record) and C2 (passive preservation in situ). Diagnostic artifacts, however, may be removed from the site and conserved ex situ (C5). At action Level III, mitigation projects may run for many years and all conservation options may be taken at various times.

Conservation Actions for Six UCH Sites in North Carolina

Six UCH sites (Table 6.6) were selected for further investigation of conservation actions. Each case site was selected on basis of criteria as described in Chapter 2 (Methods and Models). Five were OBX sites for which actions were at Level III-Mitigation (by number of references per site in the 2016 *Bibliography*). From literature review and A&H archives, a conservation

storyline was constructed in each case that included historical background, site characteristics, and archaeological and conservation actions taken over time for each site.

UCH Site Name	Wreck Date	Type	County	Geologic Zone	Location	Environment	Year Listed (Sites db)	Associated State Attraction
<i>Modern Greece</i>	1862	Civil War Blockade Runner	New Hanover	Onslow Bay (S)	New Inlet	Ocean/Inlet	1962	Fort Fisher Historic Site
<i>CSS Neuse</i>	1865	Civil War Iron Clad	Lenoir	IBX	River Neuse	River	1963	CSS Neuse Historic Site
Lake Phelps Canoes	4,000 BP-600 BP	Pre-Contact American Indian	Washington Tyrell	OBX	Lake Phelps	Lake	1985	Pettigrew State Park; Somerset Place Historic Site
USS <i>Huron</i>	1877	USS Navy	Dare	Hatteras	Nags Head	Ocean	1986	Jockey's Ridge State Park
<i>Queen Anne's Revenge/ La Concorde</i>	1718	Pirate/Slave Ship	Carteret	Onslow Bay (N)	Beaufort Inlet	Ocean/Inlet	1996	NC Maritime Museum
"George Brown" Wreck	17th Century	Merchant?	Currituck	Hatteras	Currituck Beach	Ocean/Beach	2007	Graveyard of the Atlantic Museum

TABLE 6.6. Summary of six UCH case study sites investigated – dates, locations, recovery date. (Table by author, data source: *Sites Database* (NC A&H/OSA/UAB 2011)). [Note: year listed = year first investigated and listed in 2011 *Sites Database*.]

***Modern Greece* (1862) – A&H/OSA/UAB Site Number: NEI0001**

Modern Greece was an English built, screw propelled, iron-hulled steamer and schooner-rigged vessel of 750-1000 tons and measuring 210-224 feet in length by 29 feet beam and a draft just over 17 feet (Bright 1977; Wilde-Ramsing and Angley 1985:15). In 1862, it was one of several vessels owned by Zachariah Pearson & Co. departing Hull, England, to cross the Atlantic to run the Federal blockade and bring supplies into Confederacy ports (Bright 1977:3-19). Its military cargo included several thousand Enfield rifles, pistols, swords, four Whitworth guns, gunpowder and medical supplies (Freeland 2014:42). Its civilian cargo included: liquor, textiles and food (Webster 2010:103; Freeland 2014:54;). In the early morning of Friday, June 27, 1862, it attempted to enter the Cape Fear River through New Inlet and bring its cargo into the Confederate port of Wilmington, North Carolina. Near Fort Fisher, however, it was spotted and fired on by two Union vessels, USS *Cambridge* and *Stars and Stripes* and ran aground near Confederate-held Fort Fisher (Bright 1977; Webster 2010; Freeland 2014). Both sides continued to fire on the grounded vessel for several days, each side attempting to prevent the other side

from taking the vessel and its cargo (*The Daily Picayune* 1862; *Fayetteville Observer* 1862, Watts 1989:39).

When shelling stopped, about July 3, 1862, salvage operations began by the Confederates. Items recovered included the four Whitworth guns, many of the Enfield and Belgian rifles, and several boxes of pistols. Some of the 900 tons of non-military cargo were publicly auctioned in July 1862, as were parts of the ship itself (*Wilmington Daily Journal* 1862a-j; Watts 1989:39; Freeland 2014:49,71,72;). The engine was removed and reused in ironclad gunboats being built in Wilmington (Bright 1977:18). By mid-August 1862, according to Commander Parker of USS *Cambridge*, the vessel (with much of its cargo still aboard) had settled into seabed sediments. Upper areas of the vessel had washed away, with only masts and smokestacks standing (Bright 1977:9).

Modern Greece ran aground about half a mile from Fort Fisher (Bright 1977:6) before it had reached New Inlet. New Inlet is no longer open to the Cape Fear River as in 1870 the Corps of Engineers started an 11-year project that artificially closed it (Jackson 1995). The near-shore ocean bottom in the area where the ship sank is unconsolidated sand and shell hash overlying outcrops of harder sedimentary coquina rock. Due to longshore ocean currents and storms the sand and shell sediments are constantly on the move. The vessel's structural integrity continued to degrade under the actions of marine fouling organisms, pounding waves and shifting sands. By 1962, much of the hull remains was in 30 feet of water and had settled into bottom sediments (Wilde-Ramsing and Angley 1985:6).

Over many decades part of the vessel remained in the water column above the seabed and was often visible. Its history and location were known. It was a good fishing spot, to which fishing piers were built in the 1890s and 1930s (*The Wilmington Messenger* 1891;1902a-c; *The*

Wilmington News 1937; Bright 1977:19). In the early 1950s it was still known as a good fishing location, as were the wrecks of other blockade-runners off the coast between Wilmington and Southport. In 1951, an article in the *News and Observer* listed the wrecks and a map showed their locations (Moore 1951:47). By 1955, as reported in the *Philadelphia Inquirer* “skin-diving treasure hunters” were also exploring these “Confederate Hulks” (*Philadelphia Inquirer* 1955:41).

March 6-7, 1962, the “Ash Wednesday” storm hit North Carolina. Coinciding with a spring tide the depth of wave profile during the storm moved bottom sediments off much of the wreck site. Shortly after the storm vacationing Navy divers from the Indian Head Naval Ordnance School in Maryland visited the wreck and found that overlying sand was cleared to a level below its main deck and intact cargo was visible inside. When this information reached A&H, collaborative operations involving the Navy, North Carolina Confederate Centennial Commission (NC CCC), and A&H were organized to retrieve the cargo (NC A&H 1962:43; Larson 1963; Townsend 1965a, b; Watts and Bright 1973).

Nationwide public interest in the site continued through 1962 and 1963 (Young 1962). Frenzied salvage operations continued during summers of 1962 and 1963. These were not archaeological excavations as there was no mapping or recording of the site before artifacts were recovered. Methods used to access the cargo included dynamiting and prop washing which further damaged the hull and disturbed archaeological contexts. The sole goal of operations was to recover artifacts. By the end of summer of 1963 some 11,500 artifacts had been recovered from *Modern Greece* and hundreds more from ten other Civil War wrecks in the Cape Fear area (Watts and Bright 1973; Bright 1977:22;).

The preservation challenge presented by these artifacts recovered from an ocean environment was soon realized. In 1963, A&H, with an initial investment of approximately \$40,000 from the NC General Assembly and various counties, established a Preservation Lab at Fort Fisher to treat the artifacts from Civil War shipwrecks and other historic sites (NC 1963 Ch.1040 SB169). A further \$25,000 also was appropriated in 1963 (NC 1963 Ch.1040 SB169).

At the Fort Fisher Lab various treatment methods for different materials were tested. The goal was to stabilize artifacts in the shortest possible time, so that they could be recorded, documented and exhibited. Success rates varied, many artifacts re-corroded and had to be retreated, some were lost completely (Townsend 1965a). Within months, however, some treated artifacts were on public display at the Fort Fisher Historic Site Visitor Center, for which A&H had received a separate appropriation of \$96,000 in 1963 (NC 1963 Ch1042, SB232). From 1967, when the Act to protect submerged sites was passed through at least the early 1970s, various groups continued undertaking exploration and salvage with A&H issued short-term sport and hobby permits and recovered several hundred more small artifacts from the wreck (NC A&H 1970:54-55; UAA 1971). In 1977, A&H published *The Blockade Runner Modern Greece and her Cargo* (Bright 1977). This included historical background, an account of the discovery and recovery of the vessel, a catalogue of artifact types, and summary of conservation methods used. The report had taken a team of at least 30 people, including volunteers, to produce (Bright 1977: ii-iv).

By the mid-1970s, however, many artifacts were still untreated due to lack of resources, time, facilities, and staff, and the refocusing of the A&H/OSA/UABs staff's work to other field projects and the environmental review process. Hundreds of untreated artifacts were "reburied" by immersing in water in four outside tanks sunk into the grounds of the Fort Fisher Lab (NC

A&H 1976:41; Lawrence 1977). Although the plywood covers soon disintegrated the artifacts were sealed in the tanks by accumulated leaves and sediments. Here they remained largely undisturbed for decades, until 2011.

In advance of the 150th anniversary of the Civil War interest in *Modern Greece* revived, including in artifacts still in wet storage at Fort Fisher. Some of the Enfield rifles were retrieved and conserved (Cox 2008). In 2011, staff and students of an ECU Conservation Field School worked with A&H staff to inventory and assess the condition and conservation priorities of approximately 3,000 artifacts in two and a half of the outside storage tanks (Grieve 2011). Of 2,945 objects checked in 2011, 1,096 (37%) were in poor condition (deteriorated and unstable); 1,759 (60%) were in fair condition (deteriorated but structurally stable); 78 (3%) were in good condition (slight deterioration, structurally stable); and 12 (0.4%) were in excellent condition (stable) (Grieve 2011: 15).

In March 2012, A&H and ECU staff completed the inventory and transferred most of the artifacts to new wet storage tanks at the A&H/OSA/UAB Preservation Lab at Fort Fisher in preparation for the 150th Anniversary events to commemorate the loss of *Modern Greece* (Grieve 2011; Blackburn 2012; Price 2012). In 2012, of the approximately 11,500 artifacts originally recovered approximately 4,000 (35%) were still in wet storage (now indoors in monitored tanks) at Fort Fisher.

In summer 2012, 150th anniversary events included: installation of a Highway Historical Marker; dedication of explanatory signage within an existing shore-side pavilion overlooking the wreck site; a conference in collaboration with UNCW; and an Open House at the Preservation Lab. This also was to mark the almost 50 years since the lab was established (Steelman 2012a, b). Wilde-Ramsing and Fonvielle (2011) had sought \$30,000 for these initiatives. By 2012,

through a fund-raising initiative \$14,282 had been raised to progress anniversary projects for *Modern Greece*. Additionally, in 2012, the A&H/OSA/UAB was awarded a \$50,000 National Park Service American Battlefield Protection Program Grant towards establishing "...a definitive archaeological inventory of Civil War wrecks in the Cape Fear Region" that would include *Modern Greece* (Southerly 2012).

In 1985, A&H staff archaeologists had reported heavy destruction and deterioration of the hull. Although parts of the hull in the stern and bow then were intact to deck level its sides were laid out and lower floor frames exposed. Integrity of machinery and the forward hold areas was confused due to historic and recent salvage efforts (Wilde-Ramsing and Angley 1985:15). Since then no active preservation in situ measures have been taken at the site. At the end of 2017, the vessel *Modern Greece* and its unrecovered cargo were still in the ocean off Fort Fisher. Thousands of artifacts were also still untreated and in wet storage at the A&H/OSA/UAB Preservation Lab at Fort Fisher.

CSS *Neuse* (1865) - A&H/OSA/UAB Site Number: NUR0001

During the Civil War, the Confederacy commissioned construction of 22 ram ironclads for its river fleet. Three of these vessels survive in the archaeological record in North Carolina: *North Carolina*, *Raleigh*, and *Neuse* (Bright et al. 1981: vii; Campbell 2009:11). Construction of *Neuse's* wood hull (approximately 158 feet long and 34 feet wide) began October 1862, 24 miles upstream of Kinston, at Whitehall (now Seven Springs) (Bright et al. 1981:6; Campbell 2009:28). May 1863, it was floated and poled down river to the Kinston naval station for fitting of its iron plating and engine, and official naming as CSS *Neuse* (Campbell 2009:55-56). March 7, 1864, the *New York Times* (1864:8) reported, "...The rebel ram at Kinston...is almost completed and is a very formidable affair. She is plated ten inches thick and carries four heavy

guns. The rebels are now removing the river obstructions...and are making every preparation to renew the attack on Newbern, Washington, and Plymouth.” April 1864, the almost completed vessel attempted to aid the assault on New Bern, 50 miles downstream from Kinston, but only got half-a mile before running aground on a sandbar (Bright et al. 1981:14-15). It was mid-May before river waters were high enough again for it to refloat and return to Kinston where it was finally completed June 1864 (Bright et al. 1981:15-16).

In March 1865, *Neuse* was sent down river again, where it fired some salvos at Union cavalry before retreating back upriver to Kinston. To prevent its capture by Union troops its crew spiked the cannon and set a charge in the hold to burn the hull. The charge, however, made a hole through which water flooded and extinguished the fire (Townsend 1965b; Bright et al. 1981). As the vessel was abandoned much was stripped off and its iron cladding salvaged. The casemate was thrown into the river to gain access to engines and boiler. Removal of propellers and shafts destroyed much of the stern (Bright et al. 1981:9; Campbell 2009:59). On 9 October 1865, the vessel including two engines, a donkey engine, boiler, 250 tons iron, 20 tons of coal, and three anchors were auctioned (Campbell 2009:58-59). The abandoned parts of the vessel still in the river sank into sediments but were neither lost nor forgotten. Its location in a bend of the River Neuse at Bright Street, Kinston, was known as “Gunboat Bend” (Bright et al. 1981:19).

The almost 250-mile-long Neuse River is the longest river in North Carolina and at its mouth, six miles across, the widest river in America. At Kinston in Lenoir County, its waters are naturally freshwater. River water levels at Kinston fluctuate greatly, depending on weather conditions. Draining from the Piedmont and the Coastal Plain, the Neuse generally has a high sediment input (Meade et al. 1990:263; Riggs et al. 2008:3). In heavy rainfall soils either side of the river become saturated and where slopes are flat large areas along the river quickly flood,

especially during spring freshets and hurricanes (Riley 1947:46). For example, in October 1964, in the worst floods for 35-40 years the river was predicted to reach 23 feet, which was 9 feet above flood stage (*New York Times* 1964:24). In 1999 after Hurricane Floyd the river crested at about 27.7 feet (Barnes 2013:217) and in 2016 after Hurricane Matthew at about 29 feet (Sasser and Mosher 2016).

Although much of the wreck remained under river sediments it was periodically visible when water levels were low. For example, in August 1912, when the normally six feet or more water depth was two feet or less, "...slime covered ribs of a steamer's hulk...a river gunboat used by the Confederates in defense of New Bern" could be seen (*News and Observer* 1912:6). The hull's integrity continued to deteriorate. In 1940, the Corps of Engineers reported the superstructure and practically all of the sides had been swept away during freshets (Bright et al. 1981:19).

Local residents, especially children often visited the site. In summer 1954, the sand filled ship was visible under about a foot of water and local schoolboys dug 14 "live" Brooke percussion projectiles out of the site. This revived the interest of Kinston local Henry Clay Casey, who as a youth in the late 1930s also had explored and dug into the vessel. In 1956, Casey teamed up with local professional logger Lemuel Houston to salvage the vessel but soon abandoned the operation as more challenging than they had anticipated. Not deterred, in October 1961, Casey and Houston partnered Thomas Carlyle of Swansboro, owner of a dragline, and renewed their efforts to recover the vessel (Bright et al. 1981:19).

Water levels were low at just 3.17 feet and it was envisaged recovery would be completed in a week (Bright et al. 1981:20). It would be over two years, however, before the vessel was removed from the river to the riverbank in May 1963, and another year before it was

moved from the riverbank to a riverside open-sided shelter (Bright et al. 1981:25-27). Like recovery operations at *Modern Greece* the removal of CSS *Neuse* from the river was more of a salvage operation than an archaeological excavation.

The scale and challenges of the project including size, condition, weight of the vessel, equipment needed to move it, weather, changing water levels, ownership disputes, and funding needed, were vastly underestimated or unforeseen, or both, by the salvors in 1961. By May 1964, sufficient funds had been raised, ownership disputes resolved, a joint plan of action agreed and the vessel was finally moved five miles from the riverbank to the Richard Caswell Memorial Park, an A&H Historic Site (NC A&H 1964:59-60). This move was a coordinated effort of various state and local agencies and organizations, and private contractors including County and State Confederate Centennial Commissions, Kinston City Council, Lenoir County Officials, Humphrey House Movers of Jacksonville (NC A&H 1966:60; Bright et al. 1981:25-26; Townsend 1965b).

The recovery and move were funded with approximately \$20,000 raised locally and an appropriation of \$10,000 from the Council of State Contingency and Emergency Fund. In 1964, it was estimated a further \$40,000 at least would be needed for construction of a visitor center-museum (NC A&H 1964:128). The state of North Carolina formerly acquired the vessel May 31, 1965 (NC A&H 1966:106). In 1967, the General Assembly appropriated \$75,000 to Historic Sites for a protective shelter (NC A&H 1968:44, 53). Capital Improvement funds made available 1966-1968 for the project totaled \$105,000 plus a \$5,000 grant from the Richardson Foundation (NC A&H 1968:180-181).

Artifacts (approximately 410 items) recovered from the site were treated at the A&H/OSA/UAB Preservation Lab at Fort Fisher from 1966 to 1968 (NC A&H 1968:61). Many

were judged in “good condition” having been preserved in the anaerobic conditions under sediments, and being in a freshwater, rather than a marine environment (Bright et al. 1981:135-139). During the years-long recovery operation, however, the wood hull had deteriorated. Without protection of overlying sediments, it underwent cycling periods of being wet and then dry as river water levels rose and fell. This caused warping and splitting of boards. Other elements washed away in flooding. Scavengers, removing boards and fasteners, further weakened the hull’s integrity (Bright et al. 1981:26; Caudill 2013:35).

Once at the Caswell Memorial Park, A&H staff began almost immediately to prepare the hull for public view. A support cradle was constructed and a surrounding fence erected to keep vandals and climbing public away (Bright et al. 1981; Caudill 2013:34). Its initial location at the Memorial Park was beside the river Neuse, on a concrete pad, under a shelter with no sides that provided little protection from the weather. Artifacts and interpretation information about the wreck were exhibited in an adjacent building. A new exhibit was opened to the public in late 1980 (NC A&H 1983:46). A&H conservators from the Fort Fisher lab undertook experiments and directed applications of several conservation treatments to preserve the wood hull during the 1960s and 1970s (Bright 1969; Bright et al. 1981). Despite these treatments, however, the hull continued to deteriorate, shrink and spall (Campbell 2009; Caudill 2013).

In 1981, A&H published an account of the CSS *Neuse* project (Bright et al. 1981). This included historical background, discovery and recovery of the vessel, catalogue of artifact types, and summary of conservation methods used. Almost 70 people were acknowledged for their contributions to the project, including A&H staff, local historians, community volunteers and the editor and staff of the local paper the *Kinston Daily Free Press* (Bright et al. 1981: ix). With regard to the hull’s condition the authors wrote “...If the NEUSE is to be saved

indefinitely, it will become necessary to confine it in a strictly controlled environment where temperature and humidity are kept constant” (Bright et al. 1981:137). January 1982, OSA/UAB staff submitted a written recommendation to the A&H Historic Sites Section for further preservation work on the hull (NC A&H 1983:22). It was to be another 30 years - almost half a century after its removal from the river - before CSS *Neuse* was finally placed in such an environment.

During the 1980s and early 1990s there were efforts to improve its riverside shelter. In 1986, \$89,500 was allocated for roof repair (NC A&H 1987:220). Over 1988-1990, in conjunction with Civil War 125th Anniversary events, a new roof on the shelter and access and interpretive ramp were constructed (NC A&H 1991:32). In 1990-1992, the hull was cleaned with compressed air and an intern cleaned several hundred Neuse artifacts (NC A&H 1993:33). In 1992-1994, the Kinston Convention and Visitors Bureaus donated \$5,000 for a new site entrance bridge, and new billboards (NC A&H 1995:32, 38); and 1994-1996, A&H staff received a grant for study and assessment of conservation needs of CSS *Neuse*. Engineering studies recommended the need for an enclosed shelter, at an estimated cost of \$2.5 million (NC A&H 1997:37).

In September 1996, the vessel was again underwater when the river flooded during Hurricane Fran. Floodwaters, 20 inches deep in the hull, caused considerable mold growth over the hull (NC A&H 1999:17, 25). Public and professional alarm about the condition of the vessel grew and was reported in the press, especially the local paper *The Kinston Free Daily Press*. An article on March 22 1998, quoted Bradley Rodgers, Conservation Specialist at East Carolina University: “The ship will rot. It definitely will go away if nothing is done...what they really need to do is get that thing enclosed to control the humidity...”, and Ted Sampley, local business

owner in Kinston: “It’s a national treasure and the state is abusing it...it was pulled out of the river and turned over to the state, and the state is letting it rot” (Allegood 1998a).

Many felt that bringing the gunboat to a museum in downtown Kinston would not only save the vessel and make sense historically, but also would help revitalize the area. There was no agreement, however, as to location for such a museum and no funds, estimated at \$3.27 million, to build it. In the meantime, therefore, A&H moved the vessel to a new shelter on higher ground at the Caswell Memorial State Historic Site in summer 1998 (NC A&H 2001:28). This move cost approximately \$323,000 (NC A&H 1999:160). The new location was at less risk from flooding, but the hull was still under an open-sided shelter and exposed to the weather (Allegood 1998b, 1998c). A&H Historic Sites Section did, however, receive a state appropriation for \$465,000 to begin planning for an enclosed, climate-controlled building (Allegood 1999; NC A&H 2001:28). The artifacts remained in the exhibit building close to the original shelter location beside the river.

In September 1999, when Hurricane Floyd hit North Carolina, CSS *Neuse* suffered the worst damage of any of the state’s Historic Sites. Artifacts were still in a building near the river that was flooded by heavily polluted river water, three feet deep. More than 2,000 artifacts were damaged by floodwaters (NC A&H 2001:25). The decision was made to abandon the building rather than renovate it (NC A&H 2001:1). The artifacts were transferred to a trailer and were to remain in storage largely untreated for many more years. Supporters, however, invigorated by the effects of two disastrous hurricanes, launched a capital campaign to raise funds for a permanent shelter for CSS *Neuse*.

By 2000, almost \$200,000 had been raised (NC A&H 2001:21) but in 2000-2002 state budget problems froze planning for the both the new museum and repairs to the existing facility.

In November 2001 and April 2002, conservators met to discuss how to improve conditions for CSS *Neuse* (NC A&H 2003:53). An NC DOT enhancement grant sought to improve the shelter, including concrete floor and supports under the vessel by requesting \$30,388 with a local match of \$7,596.

In 2002, public and professional concerns about the hull's condition were again reported in the newspapers. Appeals were made to Governor Easley for something to be done. The hull was now so deteriorated and unstable that within 5-15 years it would be too far-gone to save. Saving the *Neuse* through relocation to a climate-controlled museum was more urgent than ever. Moving it downtown was also seen as a crucial component of efforts to save Kinston itself. With the statewide post-Floyd economic depression there seemed, however, no likelihood of state funding for such a project, even if there was support in principal, and there was still no location for such a building (Griffin 2002:1B).

A local association was formed - the *CSS Ram Neuse Gunboat Association* - to pursue and promote the project. A key component of the campaign was the CSS *Neuse II*, a scale replica of the CSS *Neuse* built at a downtown location. This became a focus for fundraising efforts for a museum for the original ship remains, but also a tourist destination in itself, contributing over the years to a resurgence of Kinston's economy. Work on the replica had started by July 2003 (Zebrowski 2003: D1). A location for the new museum was found in buildings purchased by the *Association*, in Queen Street in downtown Kinston. In September 2003, the Governor and N.C. Council of State accepted donation of the buildings from the *Association*; an agreement that would be finalized once they were converted to a museum, for which at least \$3 million was needed. The *Association* received a \$100,000 Golden Leaf Foundation grant for design of the

building and a \$30,000 grant from federal transportation funds for preserving the hull (NC A&H 2005:58).

In 2004-2006 ECU Students designed and installed temporary exhibits in the Queen Street Building and a “Friends of the CSS *Neuse*” group was formed to help promote awareness of the project. In May 2007, the *Association* officially became a non-profit organization (*The Free Press* 2007). In July 2007, the General Assembly passed an “Act to Appropriate Funds for the Preservation of the CSS *Neuse*, A Civil War-Era Ironclad Gunboat”. From the General Fund to A&H would be appropriated \$1.75 million in 2007-2008, and \$1.75 million in 2008-2009, for “...relocation and housing of the CSS *Neuse*...to a climate-controlled facility that will house a Civil War Museum...”. (Anderson 2008; Clarke 2008). The Act acknowledged that DCR, the City of Kinston, and Lenoir County had already invested \$0.75 million in the project. In July 2008, a grant from North Carolina Sea Grant enabled ECU Maritime Studies Program faculty and students to undertake detailed recording and mapping of the hull (Campbell 2009).

December 31, 2009, the *Association* and building owner, John Marston, deeded four buildings for the new museum to the state. The new museum would be known as “The CSS *Neuse* Interpretive Center” and administered under A&H’s Historic Sites Division. There would be three phases to the project: first building a climate-controlled space and moving the CSS *Neuse* into it; second compiling the artifact collection to be with the boat and in an adjacent museum; and the final stage would include staff offices and gift shop (Anderson 2009a). A&H aimed to complete and open the Center, by 2011, marking the 150th Anniversary of the start of the Civil War (Anderson 2009b).

Designs for the new museum were unveiled in October 2009 (Anderson 2009c, d; 2010). The groundbreaking ceremony for the new museum was held in April 2011, despite legislature

attempts to recall the \$3 million appropriation to help redress a state budget deficit (Anderson 2011). June 23, 2012, CSS *Neuse* was finally moved to its new location in a building still under construction (NC A&H 2013:4; Anderson 2012; *The Free Press* 2012). The three sections of the hull (which had been cut up for its 1998 move) were separated and supported by wood and steel cradles to be loaded onto trucks for transport (NC A&H 2013:84). Keith Hardison, Director of A&H Historic Sites Division, expressed his relief and satisfaction that "...we got this extremely large and rare artifact in a climate-controlled facility" (Anderson 2012a). East Carolina University students conserved artifacts for exhibit and storage (Brooks 2012:13; Caudill 2013). There was a "soft opening" of the still in progress center a year later, in July 2013 (Wolfe 2013a, b). Due to further funding and operational challenges it was March 2015, before the Center's official grand opening (Smith 2015).

At the end of 2018, remnants of the vessel were still in the river - dislodged and discarded during its scuttling and subsequent salvage, and by river flow as the hull deteriorated in situ (Lawrence 1982). During 2002-2004, A&H/OSA/UAB staff documented a fragment of the casemate (Lawrence 2002; NC A&H 2005:31). In 2014, A&H planned to undertake a detailed survey of the river for remains of CSS *Neuse*, but attempts so far have been abandoned due to weather and the river being too high or too low.

Lake Phelps Canoes - A&H/OSA/UAB Site Number: PHL0001-PHL0022

The 2011 *Sites Database* (NC A&H/OSA/UAB 2011) listed 65 dugout log canoes discovered in North Carolina's Coastal region. From 1985 to 1987 22 dugout log canoes discovered in Lake Phelps in Pettigrew State Park were first investigated. Dugout log canoes were used by inhabitants of the Southeast's coastal regions to navigate inland waterways (lakes, rivers and creeks) over thousands of years. They are probably the oldest and longest used form of

water transport in eastern North Carolina, and are both historically documented and archaeologically discovered. Made from pine and bald cypress logs, canoes were dug out by alternate scraping and burning. The first Europeans in the area illustrated and described their construction and use by Native Americans. For example, John Lawson in 1709, described how “...Of these great Trees the Pereaugers and Canoes are scoop’d and made...This wood is very long lasting and free from the Rot. A Canoe of it will outlast four Boates and seldom wants Repair.” (Lawson 1709).

Lake Phelps is a natural rain fed lake and no natural streams feed or drain it. Natural discharge is by flooding along its northwest shore (Heath 1975; Holley 1989). Its deepest parts are normally 10-12 feet deep. The water is acidic (with pH between about 4.5 and 6.0) and usually clear despite ground water draining into the lake through surrounding peat deposits, which might be expected to cause tannic brown discoloration. A manmade, perimeter canal may act as aquifer filtering water before it reaches the lake basin (Shomette 1993). Core sampling of sediments along the northern rim of the lake in the 1980s, established a sequence from upper to lower levels of: black water-charged organic mud about 13 inches thick; dense fine, laminated quartz sand, silt, organic-rich clay about 12 inches thick; dense black and gray clayey soil about 4 inches thick; and finally, peaty material and burned wood (Holley 1989; Shomette 1993).

Archaeological investigations at the lake have found evidence of prehistoric occupation from the Late Paleo-Indian (approximately 12,000-8,000 B.C) to Late Woodland periods (approximately A.D 800 to 1650). It seems to have been abandoned by the time Europeans discovered it in 1755 (Pierce 2010:3,13, 25). Until the end of the 18th century, it was a land-locked, rain-fed internal drainage basin, with water levels fluctuating naturally through evaporation and precipitation. Local planters eventually cut canals from the Scuppernong River

to the lake to control drainage and water supply to surrounding swamp land that was being drained and used for agriculture (Phelps 1989). In more recent times water level falls have also been caused unnaturally by pumping out water to fight surrounding forest fires.

In 1985-1986, natural and unnatural events reduced water levels, revealing several dugout log canoes within about 164 feet of the lake's shoreline. These were the worst two years of drought in North Carolina since 1887 (Stahle et al. 1988) so water levels were not being replenished by precipitation. In addition, in spring 1985, water was pumped out of the lake to fight a local forest fire causing water levels to drop by over 2.5 feet. Around the shoreline, wind induced waves likely had sufficient depth profiles and strength to move bottom sediments. This combination of very shallow water and wind-induced movement of sediment exposed the canoes. Park staff discovered the first of the exposed canoes in November 1985 (Lawrence 1985a, 1986, 2007; Watkins-Kenney 2008).

By end of August 1986, A&H underwater archaeologists and Park staff had recovered four canoes from the lake (Bright 1987; Lawrence 1985a, 1986). In fall 1986 A&H staff and a research team from East Carolina University surveyed and recorded exposed canoes still in situ. By 1989, 30 canoes had been found, as well as ceramic and stone artifacts that ranged in date over 11,000 years. Only the first four canoes discovered were recovered, and conserved ex situ. The rest were recorded, documented and left in situ (Morris 1986; Bright 1987; Phelps 1989; Watkins-Kenney 2008). Wood samples from nineteen of the canoes were dated by radiocarbon dating from approximately 1400 AD to 2,400 BC (Beta Analytic 1987a, b; Eastman 1994); all were identified as bald cypress (*Taxodium distichum*) (Bright 1987; Wheeler 1987).

The four canoes conserved ex situ were treated between 1986 and 1987 with sucrose solutions before being air-dried (Bright 1987; Watkins-Kenney 2008). This method had recently

been published in the conservation literature (Parrent 1985). The treated canoes have been displayed or stored at different locations in eastern North Carolina. Canoe #2, the longest and most complete one recovered, was transferred to Museum of History in Raleigh in April 1987, where it is on permanent display. Canoes #3 and #4 were treated initially at Pettigrew State Park but were transferred to the Preservation Lab at Fort Fisher for further treatment. Both were returned to the Park in September 1987 and displayed in the Visitor Center building beside the Lake (Lawrence 2008a). After treatment, the three parts of Canoe #1, were in three different locations; one section was at the North Carolina Estuarium in Washington; one was at Plymouth's Maritime Museum; and the third was in storage at the A&H/OSA/UAB facility at Fort Fisher (Watkins-Kenney 2008).

Following their initial treatment, all four of the canoe, came to exhibit signs of deterioration (surface deposits and/or color change) and needed retreatment and/or relocation to better display or storage environments (Watkins-Kenney 2008). In November 2009, Canoes #3 and #4 were relocated in their display cases from the Visitor Center (an uncontrolled environment, close to the lake, liable to flood, and under direct light from windows) to another storage building at Lake Phelps. This was still an uncontrolled environment but not liable to flood and with no natural light. In July 2011, the two canoes were transferred to the A&H/OSA QAR Conservation Lab (QAR Lab), located at East Carolina University (ECU) for investigation, re-treatment and preparation for re-display at Pettigrew State Park (NC A&H/OSA/ QAR Lab 2009, 2011; Gilman 2015).

QAR Lab staff then worked with ECU research staff and students to identify the nature and cause of the surface deposits and to determine a retreatment program (Hauck 2011; O'Cain et al. 2012; Gilman 2015). With no A&H appropriations, re-conservation of these canoes has

depended on availability and interest of ECU faculty and graduate students in Departments of Anthropology, History/Maritime Studies, Chemistry, and Physics over the years. Gilman (2015) developed a conservation strategy and treatment for them. As of end 2018 its implementation, however, still has to be completed due to lack of resources. It is hoped that a new visitor center to be constructed at Lake Phelps will include a display space for the eventually retreated canoes.

Of the 22 canoes discovered in Lake Phelps, 1985-1987, all but the above four were left in situ. It was assumed that without resources for their recovery, conservation or exhibition, they were better left in the lake. This was passive preservation in situ since no active measures were taken to control the in-situ environment. Since the mid-1980s, A&H staff with other researchers have periodically returned to Lake Phelps to check, to varying degrees, on these canoes, including in 1992, 2004, 2007, and 2011 (Shomette 1993; Lawrence 2004; Curci 2006; Watkins-Kenney 2008; Pierce 2010).

Canoes periodically checked were those that might be partially visible at the time of the visit, usually when water levels in the lake were low. Overall, water levels in the lake remained well below normal for 12 years after 1985-1986 (Watkins-Kenney 2008:9) but as water levels rose, sediment cover over the canoes increased, and they became increasingly difficult to find. By 2004, lake level was over 3 feet higher than in 1986 (Lawrence 2004). In 2004, A&H staff were unable to relocate four of the canoes in their locations as recorded in 1986. On this 2004 visit, ECU researcher Curci (2006) who was undertaking a morphological study of canoes, but was also interested in whether leaving the canoes in situ since 1986 had been an effective method of preservation, concluded that the condition of canoes located was good. No objective measures, however, for this assessment were reported. Although reference was made to comparison with earlier photographs none were presented as evidence (Curci 2006).

On some of subsequent visits by A&H staff, for the canoes located, environment parameters were measured including water depth, depth of sediment, and water pH. The condition of the wood on some visits was also tested with a pin. The depth to which a pin can be pushed into waterlogged wood gives an indication of how degraded it is. The more degraded the wood, the softer it becomes and the further a pin can be pushed into it (Grattan 2000: 665-666). There has been no comprehensive effort to relocate and systematically check and monitor the condition of all the canoes that were left in the lake after their discovery in the mid-1980s, apart from the Curci study conducted in 2004. At that time, however, not all the canoes were located including some have not been seen since the mid-1980s.

USS *Huron* (1877) - A&H/OSA/UAB Site Number: BOB0012 (31DR083)

USS *Huron* was an iron hulled “sloop-of-war” built in 1875, at Delaware River Shipbuilding Company, Chester, Pennsylvania. It was one of seven vessels authorized by Congress to be constructed to counteract the decline in American naval power following the Civil War (Lawrence 2003:61). Its length was 175 feet (53.4m), beam 32 feet (9.75 m) and draft 13 feet (3.96 m) amidships. It had a displacement tonnage of 541 tons, 1,020 tons fully loaded. Its crew was 16 officers and 118 enlisted men. USS *Huron* and two sister ships, USS *Ranger* and USS *Alert*, were the last American naval vessels built of iron rather than steel. The vessel was fitted with sails as well as a steam engine. Its ordnance included Civil War cannon as well as a relatively new 50 caliber Gatling gun (Lawrence 2003:61).

After two years with the North Atlantic Squadron, USS *Huron*, in November 1877, departed from Hampton Roads, Virginia, to survey and map the coast of Cuba. The day after leaving Hampton Roads, USS *Huron* ran into a gale from the southeast after clearing Cape Henry (Lawrence 2003:59). Just after 1.00 o’clock in the morning, of November 24, 1877, the

vessel ran aground at Nags Head on North Carolina's Outer Banks, in Dare County. Thirty-four people on board made it to shore but 98 lost their lives even though the vessel was aground close to shore. There was a lifesaving station nearby but it was closed. This disaster caused a national outcry as did the loss of the steamship *Metropolis* two months later with 85 lives lost when it ran aground just 23 miles to the north. These two disasters prompted Congress to eventually provide additional funding for the Lifesaving Service and new stations were built along North Carolina's coast by 1883 (Lawrence 2003:61).

Remains of the wreck are 754 feet (230 m) off shore at Nags Head. Submerged under 18 feet (5.5 m) of water, it is alternately exposed and recovered by shifting sediments. Its location was not "discovered" as it was never lost. On shore a Highway Historical Marker (B-31) has commemorated the wreck and loss of life since 1953. The wreck can be reached by swimming from shore and since the 1960s has been a popular dive site. The bow is less than 9.8 feet (three meters) below the surface and site visibility is usually good as the wreck is over 16 miles (26 km) from the nearest inlet (Grussing 2009:95).

In this part of the Outer Banks the seabed has a sand lens over a medium gravel substrate on which heavy objects come to rest after sinking through the sand level. The wreck of USS *Huron* has settled into these sediments to just below its waterline (Horn 2014:74). Being so close to shore the wreck site is in a highly dynamic environment. It is alternately almost completely covered by sediment and uncovered at other times. There is generally a north to south longshore current, which is the primary mover of sediments across the site (Mallinson et al. 2008:2; Horn 2014:74). During winter with increased northerly swells, sedimentation over the site can increase such that it can be almost completely covered. The wreck traps sand creating in effect a seasonal sandbar (Horn 2014:74). South of Nags Head, over the last 149 years the shoreline has receded

about 1,000 feet, but in the last 58 years there has been minimal shoreline migration in North Nags Head where the wreck is located (Riggs 2008 et al.:11; Horn 2014:74).

In the 2011 *Sites Database* (NC A&H/OSA/UAB 2011) the wreck is listed as first investigated by A&H staff in 1986. The first detailed archaeological investigation and recording of the wreck were done in 1987 and 1988 by Joe Friday, an ECU Maritime Studies graduate student for his Master's thesis research with assistance from A&H staff (Friday 1988). Artifacts recovered during these investigations were conserved at the Fort Fisher Preservation Lab.

These initial investigations and documentation supported the designation and listing of the wreck on the National Register for Historic Places (NRHP). Following the recently enacted federal Abandoned Shipwreck Act (1987) states were encouraged to “create underwater parks or areas to provide additional protection for such resources” (ASA 1987, Section 4). Following the 1987-1988 investigations at the site, A&H believed USS *Huron* would be an excellent choice for the state's first shipwreck preserve (Lawrence 2003:65; Grussing 2009:96). As a dive site, the remains were already known and popular. The vessel itself had a significant and interesting local and national history. It had been extensively researched and archaeologically investigated and the town of Nags Head was interested and willing to assist with monitoring and managing the site (Grussing 2009:96-98). In 1991, the wreck was designated as North Carolina's first underwater Historic Shipwreck Preserve - to promote preservation of this historic shipwreck site while making it more accessible to the general public (Allegood 1991; Lawrence 2003).

As a U.S. military vessel, the U.S. Naval History and Heritage Command (NHHC) still owns the wreck. A Memorandum of Agreement was established with A&H to facilitate management of the site at state and local level (Lawrence 2003; Cohn and Dennis 2011:1064-1065). The Town of Nag's Head agreed to be responsible for maintaining, managing, monitoring

and interpreting the site as a shipwreck preserve. Their annual report to the NHHHC provided the status of the preserve, visitor figures, and any observable changes or impacts to the site. During the dive season, the town's responsibilities also included marking the site with two buoys, making monthly inspections, tracking visitation and developing interpretive signage at the beach access to the wreck (Lawrence 2003:67).

Nags Head contributed startup costs and provided staff time. A local non-profit group, The Outer Banks Community Foundation, made a grant of \$3,000 for an exhibit gazebo, brochures, travelling exhibit and underwater commemorative marker. A&H staff also donated State resources and time. In 2000, the town spent a further \$1,200 on replacing signage (Grussing 2009:99). Public access to the wreck is open and free. Between 1991 and 2001, approximately 3,000 divers visited the wreck, with many more beachgoers visiting the exhibit gazebo (Lawrence 2003:69). The USS *Huron* shipwreck preserve has been considered effective for four reasons – the wreck was already a known and popular dive site; there was local enthusiasm and willingness to support its designation via monitoring its condition and visitor activity; a site of national and local significance; and due to its documentation and listing on National Register of Historic Places (Lawrence 2003; Cohn and Dennis 2011:1064-1065).

Apart from the initial recording and documentation, and seasonal monitoring by Nags Head staff, and periodic visits by state archaeologists to visually check the site, the overall conservation strategy for the wreck itself has been one of passive preservation in situ (C2). Nags Head annual reports have included a site map indicating how much of the wreck was visible during that year's dive season. These reports provide some record of sediment levels over the wreck year to year. Divers visiting the site also make reports on its condition (Grussing 2009:101). The wreck is usually completely covered with sediment in winter and early spring,

but in summer, while the aft section may still be under sediment, the forward section can be completely uncovered (Horn 2014:68-69).

Parts of the hull, sternpost, and rudder, were badly damaged during salvage efforts in 1877 (Friday 1988:71; Lawrence 1997:200-201). In 1927, according to a local fisherman the wreck was 175 yards from shore, and the tank, boiler, and bell were visible (Friday 1988:89). Its condition in 1986-1987 was described by Friday (1988:89-95). The bow rose sharply from the sand, almost 15 feet towards the ocean surface. The wreck listed to port, and debris was spilled alongside the hull. Inside collapsed bulkheads and decking were covered in barnacles, indicating they had been out of sediment for some time. On the starboard side, exposed wood decking was still strong “indicating that it has been buried under sand until recently” (Friday 1998:91). Elsewhere on the stern section, bare metal with a lack of barnacles indicated bottom sediments had only recently been removed from this area. There were still remains of the ship’s stores in the vessel but the wreck was being stripped by souvenir hunting scuba divers visiting the site. At the time of the preserve’s establishment in 1991, the hull’s bow was almost 15 feet (4.5 m) above bottom sediments (Lawrence 1997:201).

In 2012 and 2013, an investigation of the wreck’s condition, including seasonal monitoring of corrosion rates of the iron hull and of its interaction with its environment, was undertaken for an ECU Master’s thesis (Horn 2014). An aim of the research was to determine how seasonal changes in environmental parameters, including dissolved oxygen, salinity, temperature, and degree of sediment cover might be affecting corrosion rates of the iron components of the hull. This assessment could help inform future management strategies for the vessel as a shipwreck preserve. At the time of the study the wreck was 12-20 feet below the

water surface and within a 4 inch to 4 feet (0.1m-1.2m) sand layer over the gravel substrate (Horn 2014:47).

To gain data on the wreck's condition and to illustrate interaction with its environment, the project included seasonal in situ corrosion monitoring and mapping and three-dimensional modeling. The latter modeling was done through combining information from Friday's (1988) plans, Town of Nags Head reports on areas covered or not year-to-year and additional recording during site visits by Horn and his team in 2012 and 2013 (Horn 2012, 2014). The fieldwork costs were approximately \$12,000 and funded in part through a 2012 North Carolina Sea Grant Maritime Heritage Fellowship.

Active corrosion of iron is an electrochemical process, requiring oxygen and water to proceed. Horn's study found that the iron hull was in a state of active corrosion that appeared to be uniform across its structure. Higher average corrosion potentials were measured where dissolved oxygen concentrations were also higher. Dissolved oxygen levels were higher where wreckage was uncovered compared to that which was under sediment (Horn 2014:80-83). Horn (2014:111) recommended cathodic-protection by attachment of sacrificial anodes to areas of the exposed hull to reduce corrosion potential. This would be active preservation in situ (C3). As of 2018, this has not been done.

Queen Anne's Revenge (1718) - A&H/OSA/UAB Site Number: BUI0003 (31CR314)

In March 1717, a French slave trade ship, *La Concorde*, owned by René Montaudouin, departed Nantes, France, on the first stage of a voyage via Juda in West Africa to the French colony of Martinique in the Caribbean. When the ship departed Juda in early October 1717, there were almost 600 people aboard (516 enslaved Africans and at least 73 French crew). On November 28, 1717, almost at the end of its Middle Passage voyage the ship was captured by

pirates under the command of “Edouard Titché anglais” (Mesnier 1717; Ducoin 2001:5). They took the ship, renamed *Queen Anne’s Revenge*, as their flagship under command of “Titché” who was the pirate also known as Blackbeard. The French crew and enslaved Africans were put ashore on the island of Bequoya, and given one of the pirate sloops, with which they eventually reached Martinique.

Researchers have uncovered the history of these events through research in historical archives in America, France, England and the Caribbean. Documents found include depositions made by *La Concorde’s* Captain Pierre Dosset (1718a, b), and First Lieutenant François Ernaud (1718) on their return to France (without the ship). Archival research also produced correspondence of government officials in Martinique including between the Governor Feuquières (1717, 1718), the island’s Acting Intendent, Charles Mesnier (1717), and the ship’s outraged owner, René Montaudouin following the ship’s capture by English pirates (Mesnier 1717; Ducoin 2001). The capture and renaming of the vessel were recorded in the October 1718 indictment of William Howard, Blackbeard’s Quartermaster:

“...on or about the -----day of December the said W^m Howard and other of his Associates did Pyratically take and Seize the ship Concord of Saint Malo commanded by Capt D’Ocier belonging to the Subjects of the French King... near the Island of St Vincent in the West Indies... Howard in Company with...Edw^d Tach and other their Confederates and associates in the...ship called the Concord of St Malo and afterwards denominated by the said Pyrates by the name of Queen Anne’s Revenge...” (in Lee 1974:205).

The ship’s voyage as *Queen Anne’s Revenge* ended in June 1718, when it grounded and was abandoned off Beaufort Inlet (then Topsail Inlet) North Carolina. Its voyages around the Caribbean, besieging of Charleston and eventual loss were documented in several contemporary documents including the 1718 trial records of Stede Bonnet and other pirates who sailed with him and Blackbeard and *Queen Anne’s Revenge* (South Carolina Court of Vice-Admiralty 1719).

The last recorded sighting of the vessel found by researchers is a letter from Ellis Brand, captain of the British Naval vessel HMS Lyme, a guard vessel patrolling the Virginia – Carolinas coastline. To the Board of the Admiralty he reported:

“...On the June 10 or thereabouts a large pyrate Ship of forty Guns with three sloops in her company came upon the coast of North Carolina ware they endeavour’d To goe in to a harbour, call’d Topsail Inlett, the Ship Stuck upon the barr att the entrance of the harbor and is lost; as in one of the sloops...”
(Brand 1718).

Although the exact location of the pirate ships was lost, the story of *Queen Anne’s Revenge* and Blackbeard, were not forgotten. The first bestseller account being Captain Charles Johnson’s *A General History of Pirate* first published in London, England in 1724, and still in print (Johnson 1724). Through the following 300 years Blackbeard, “lived” on through the many histories, stories, legends, plays and newspaper reports written about him.

Since at least the early 1990s, numerous researchers have traced the history of this one ship that had two names - *La Concorde* and then *Queen Anne’s Revenge* (Moore 1997; DeBry 1999; Butler 2000, 2001, 2007, 2018; Moore and Daniel 2001; Ducoin 2001; 2002; Lawrence 2008b; Wilde-Ramsing 2009a, b). The history of *La Concorde* has so far been traced back to 1710. Its origins including where, when and for whom it was constructed, however, remain elusive (Ducoin 2001; Moore and Daniel 2001; Wilde-Ramsing 2009a, b). Records for four voyages made by Montaudouin’s *La Concorde* have been found. It sailed as a privateer in 1710-1711 during the War of Spanish Succession (1701-1714) and completed two slave trade voyages in 1713-1714 and 1715-1716. In March 1717, it departed Nantes, for the third and final time as a slave trade ship. The *Role d’armament* for this voyage records the vessel as a 200-ton ship, armed with 14-16 cannon and roster of 73-75 men (Dosset 1718b; Ernaud 1718; Ducoin 2001:59).

Beaufort Inlet, at the north end of Onslow Bay is a barrier-island tidal inlet, fronted by a migrating ebb-tidal delta, but is generally sediment-starved with little fluvial input or exchange from adjacent bays (Wren et al. 2008:113). Although Lookout Shoals accumulate vast amounts of sand, most of it is transported seaward, thereby maintaining the shoals, rather than supplying sediment into Onslow Bay (McNinch and Wells 1999; McNinch and Luettich 2000). Its rocky hard-bottom of carbonate, coquina-like sandstone, mudstone, or peat, from the base of the shore face, may be covered by a thin layer of sand or be exposed with relief up to 33 feet (10 m). Differences in distribution and thickness of fine sand sediments that do reach the Bay indicate they are highly mobile and easily suspended (Wren et al. 2008:114; Riggs et al. 2011).

Historic charts show that from the early 1700s to the 1930s, when the channel was dredged, the inlet migrated several times over the wreck site. Changes in channel orientation occurred at least nine times, and were linked with at least five shoaling periods, each lasting about 45 years. As the channel migrated, water depths changed from an estimated 12 feet (3.7m) at the time the ship grounded, to almost 10 feet (3m) during the 1800s, to a depth of 23 feet (7m) by 2000. Additionally, over the last 300 years currents in the area have eroded the seafloor to depths of 16.5 – 23 feet (5-7m) (McNinch et al. 2001; Wells and McNinch 2001; McNinch et al. 2006). In this dynamic environment it is likely the remains of the ship would have quickly sunk into sediments while its wood hull disintegrated and soon disappeared from view (Wilde-Ramsing 2009b).

In 1996, two major hurricanes directly hit coastal North Carolina: Bertha in July, and Fran in early September. This was the first time two hurricanes had hit the coast during the same season for forty-one years (Barnes 2013:156). With a south-to-southeast orientation, Onslow Bay is vulnerable to direct hits from tropical storms and hurricanes. When nor'easters hit during late

fall, winter and early spring, winds and waves are offshore and significant wave heights can reach over 6.5 feet (2m). At Beaufort Inlet, adjacent barrier islands, Bogue and Shackleford Banks, and the Lookout Shoals, provide some protection from east and northeast storms. During the spring and summer, however, southwest winds predominate, and the inlet can be in direct line of hurricanes. Northerly and southerly wind events in the Bay area are commonly sufficient to generate shear stresses in the bottom seabed boundary layer to suspend and transport sediments (Wren and Leonard 2005; Wren et al. 2008:112-113; Riggs et al. 2011:10).

In November 1996, divers from Intersal Inc, under the direction of Phil Masters and Mike Daniel, surveying the ocean side area of Beaufort Inlet for shipwrecks under permit from A&H, discovered remains of an early 18th century shipwreck, partially exposed due to the season's hurricanes (Wilde-Ramsing and Rodriguez 2008). The wreck site is just over 1.3 miles (2 km) south of the coast, 0.8 miles (1.4 km) west of the present Beaufort Inlet shipping channel, at a depth of about 24 feet (7m) below mean sea level (Wilde-Ramsing 2006:167). From artifacts initially found it appeared to be an armed early 18th century vessel and given its location, was suspected to be *Queen Anne's Revenge (QAR)* (Moore 1997; Lusardi 1999, 2000; Wilde-Ramsing 2006).

As the wreck site is in state waters, A&H is the public agency with responsibility for its management, investigation, preservation and protection. A&H staff first visited the site November 22, 1996, but its discovery was not publicly announced until March 1997 (Wilde-Ramsing and Lusardi 1999). The site, assigned OSA site number 31CR314, was designated a state protected area at that time. In 2004, the site, as *Queen Anne's Revenge*, was listed on the National Register of Historic Places.

Following preliminary (Level I-II) investigations at the site, and analysis of artifacts recovered 1997-1999, *The Management Plan* (Wilde-Ramsing and Lusardi 1999) presented options for its future protection, preservation and study. Due to the significance of the site, its location, vulnerability to continuing damage by storms and hurricanes, and the uncertainty of success and costs of maintaining in situ preservation indefinitely, action at Level III – Mitigation, through full archaeological excavation and recovery of all artifacts, was recommended (Wilde-Ramsing and Lusardi 1999). This approach was recommended for maximizing archaeological and public benefit and preserving remains in the long term. Until funds and facilities were available, however, monitoring, maintenance and preservation in situ, with limited exploration and recovery, were recommended as the management strategy. This approach has been the overall strategy for the site since 1999 (Wilde-Ramsing 2009 a, b; Wilde-Ramsing and Carnes-McNaughton 2018).

Before full excavation of the site and recovery of all artifacts could begin, a conservation facility with capacity to treat artifacts recovered, and a long-term repository for their storage and display had to be established. A&H's Maritime Museum in Beaufort, North Carolina is the designated long-term repository for the artifacts. Since 2002, the *Queen Anne's Revenge* Archaeological Conservation Lab (QAR Lab) has been located at East Carolina University (ECU), in Greenville, NC, under a 2002 Memorandum of Agreement between (ECU) and NC Department of Cultural Resources. The QAR Lab was officially opened in January 2004 and is operated and administered as an outstation of A&H (Watkins-Kenney 2010a; b).

Since 1997, investigations of the site have been undertaken and coordinated by A&H staff, in partnership with many other organizations and individuals (Wilde-Ramsing and Carnes-McNaughton 2018). The working hypothesis for the research has been that the shipwreck is

Queen Anne's Revenge. As initial investigations (1997-2001) were reported, however, nothing had been found that could absolutely prove its identity as *Queen Anne's Revenge* or *La*

Concorde. In 2001, researchers stated:

“...although comparatively few artifacts have been recovered during the initial five-year assessment phase of the project none can be directly attributed to either French manufacture or typical slave trading operations, both expected if the wreck represented remains of Montaudoin's *Concorde*.” (Moore and Daniel 2001:28).

This initial lack of French, African, or slave trade associated artifacts, or any that could be definitely identified as pirate artifacts, caused debate as to whether the shipwreck found was or indeed could be *Queen Anne's Revenge* (Miller et al. 2005; Moore 2005; Rodgers et al. 2005; Lusardi 2006; Webster 2008:14-15). In 2005, at a public symposium at ECU, A&H staff and other researchers presented results of investigations of the site and artifacts thus far to the public and a panel of outside experts. Options for future actions were discussed and the overall opinion was that full excavation and recovery should continue. Systematic excavation of the site, progressing from the stern toward the bow, began in fall of 2006.

As painstaking investigation, examination, analysis, documentation and conservation of the shipwreck site and of artifacts recovered since 2006 has progressed so has evidence accumulated not only for its being an English pirate vessel but also a French slave trade vessel. By 2012, it was possible to make the case “Beyond Reasonable Doubt” for its being *Queen Anne's Revenge* (Wilde-Ramsing and Ewen 2012). This identification was based on historical research, and archaeological evidence including: the location, size, construction, and nature of the vessel and artifact assemblage recovered from the wreck site (Wilde-Ramsing and Ewen 2012; Wilde-Ramsing and Carnes-McNaughton 2016; 2018).

In the coastal waters of North Carolina, if exposed in the water column, organic materials, especially wood are quickly destroyed by biodegradation - especially through actions of teredo worms. With many episodes of uncovering of sediments over the wreck over the last 300 years, almost all the hull of the ship and its rigging has gone. Part of the sternpost and some hull planking survive in areas that may have remained more under sediment, though even these remains are extensively eaten away by shipworm. Many thousands of artifacts, however, have survived at the site.

Recovery operations have continued as funding has been available. By fall 2015, approximately 60 percent of the site had been excavated and almost 400,000 artifacts recovered (Kenyon et al. 2017; Morris 2018; Watkins-Kenney 2010a;b; Watkins-Kenney 2018). Over 90 percent of which were recovered in field seasons in 2007-2009. Artifacts recovered included: two anchors; 23 cannon; part of the wood stern post and hull planking; two bells; over 250,000 lead shot; over 15,000 ballast stones; pewter plates; ceramics; medical related artifacts; approximately a 1000 glass bead fragments; and 20 grams of gold dust. Most artifacts recovered are encased in concretion composed of iron corrosion products, sediments and inorganic remains of marine life (North 1976). Over 3,000 such concretions have been recovered, within which x-radiography has revealed encase at least 100,000 artifacts. By the end of 2017, approximately a quarter of all artifacts recovered had completed conservation and documentation at the QAR Lab, and been transferred to the Maritime Museum in Beaufort. Many are on display at the museum, with permanent exhibits opened in 2011 and expanded in 2015. A further expansion of the exhibit opened in June 2018, as part of the Blackbeard 300th Anniversary (1718-2018) events.

Level III-Mitigation, with full excavation of the site and recovery of all artifacts continues as funding is available. Since discovery funding has come from various sources including: recurring and non-recurring state appropriations; local, state and federal grants; and private donations from foundations and private citizens. In total, this amounts to approximately \$10 million over 20 years from 1997 to 2017 (Figure 10.25). There have been many and various in-kind contributions from partner organizations and individual volunteers (Wilde-Ramsing and Carnes-McNaughton 2018).

In addition to *conservation ex situ* (C5), other conservation options enacted at the QAR site since 1997 have been *active in situ preservation* (C3), *reburial* (C4), and *preservation by record* (C1). *Active preservation in situ* actions have included: monitoring sediment cover; sandbagging exposed and scoured areas around the central pile; deposition of a near-site, sand berm in 2006; and 2008-2015 in situ monitoring and cathodic-protection of cannon and anchors through attachment of sacrificial anodes (Watkins-Kenney et al. 2004; Wilde-Ramsing and Rodriguez 2008; Welsh 2010; Bernstein et al. 2015; Watkins-Kenney et al. 2015; Wilde-Ramsing et al 2016; Kenyon et al. 2017). *Reburial* was undertaken for some of the cannon in 2007. Four were moved off the archaeological footprint of the main site to a holding area to the south and re-buried under sediment. They were recovered in 2013 and transferred to the QAR Lab for conservation ex situ (Watkins-Kenney et al. 2015; Kenyon et al. 2017). As an archaeological site, the shipwreck is documented and recorded (mapped, photographed, illustrated, and described) as it is investigated and excavated (Cantelas 1997; Wilde-Ramsing et al. 2016; Wilde-Ramsing and Carnes-McNaughton 2018). Contexts and exact proveniences of artifacts are recorded in relation to a baseline before they are removed from site. All artifacts are assigned a unique find number, through which they can be linked to their site context, post-

recovery locations, treatments and analysis; satisfying requirements for *preservation by record* (C1).

“George Browne” Wreck - A&H/OSA/UAB Site Number: CKB0022

Remains of wood hulled sailing vessels are periodically found on North Carolina’s beaches. For much of the time they are buried under sand, but periodically may be uncovered by storms and beach erosion. Once exposed to the elements they then continue to break up. The *Sites Database* (NC A&H/OSA/UAB 2011) listed approximately 150 such shipwrecks found on coastal beaches, particularly those of the more northern Outer Banks in counties such as Dare and Currituck.

Since the 1970s, A&H’s policy for beach wrecks has been a tagging and recording program rather than recovery (SIDCO 2002; Watkins-Kenney 2010c). To remove, conserve, store or display all such wrecks from the beaches is beyond the resource capacity and remit of A&H, due to the expense, logistical difficulty and long-term commitment required for such actions. Mostly consisting of fragmentary remains, beach wrecks are usually not identifiable and are likely not in the original wrecking location. The tagging program enables wrecks to be tracked as they move and break up and ensures that a wreck is not counted more than once. The work often involves local volunteers and interested group. Thus, the default conservation strategy is preservation through record (C1). Beach wreck remains are documented but left in situ and acknowledged will eventually break up and be lost.

In September 2008, after a nor’easter storm, remains of a vessel that was to challenge this policy at least for one wreck, were first exposed on Corolla Beach. The story of the discovery and eventual recovery from the beach of this wreck can be followed through email correspondence between the various players collated by Henry and Watkins-Kenney (2010) and

as recorded in the press (for example Hampton 2010 a, b, c). The wreck proved to date to the early Colonial period and to be one of the oldest found in North Carolina. It was probably an early 17th century English-built vessel with a hull originally 70-80 feet long and 20 feet wide (Brown 2013:18).

The newly exposed wreck was first reported to A&H in September 2008 by a member of the public, George Browne. After confirming that it was not previously recorded in October 2008, the wreck was given an OSA site number, 0022CKB, named the “George Browne” Wreck, and no further action was taken. A year later in October 20, 2009, the wreck was again uncovered and reported to A&H by the Site Manager of Currituck Lighthouse (at Corolla Beach). December 22, 2009, following another storm, the wreck was uncovered again below the lighthouse and reported to A&H by staff of the CAMA/Currituck County Planning Department. The wreck appeared to have moved from the previous year and was now much more exposed.

Between December 23 and December 29, 2009, several members of the public reported further sightings of the wreck. George Browne, who had first reported it, sent pictures and a request for it to be tagged. A&H staff asked the lighthouse manager to tag the wreck. This was done December 30. A&H requested more information and GPS co-ordinates, stated the wreck should be recorded and that they hoped to get to Corolla soon to do this. A&H staff were not able to get to the wreck due to a Department wide ban on staff travel due to the state’s financial situation.

Finally, in January 2010, A&H archaeologists received permission to travel to Corolla Beach to inspect and make preliminary recording of the exposed wreck. They also met with local residents and examined artifacts they had found metal detecting in the vicinity of the wreck. By this time local residents and enthusiasts, particularly Browne, who had first reported the wreck

and one of the local collectors Ray Midgett were beginning to question and challenge A&H's policy for preserving beach wrecks through record rather than recovery and conservation ex situ (Henry and Watkins-Kenney 2010).

Through February 2010, more reports and enquiries came to A&H from members of the public about the wreck. On February 10, one contacted state Senator Marc Basnight, who was serving as the President Pro Tempore of the NC Senate, to inform him that it is "...sad that nothing is being done to preserve these wrecks" (Henry and Watkins-Kenney 2010). Between mid-February and mid-March 2010, the Currituck Lighthouse Manager made reports to A&H about the condition and movement of the wreck that revealed the keel was visible, and the wreck was moving to the south and nearer to the waterline. Possible plans for removing it from the beach began to be discussed by A&H staff in February. By March 10, 2010, the wreck was near the Sailfish entrance of the Whalehead Community. Local collectors were also reporting its movements and collecting small-detached parts from the wreck for A&H. Special permission to travel was again granted to the A&H team to visit the wreck in week of March 15. By this time, it was clear that the wreck was much earlier than those usually appearing on North Carolina's beaches. From structural features and artifacts removed by local collectors, it was thought it could date to the early 1600s. A&H, however, had no means to recover major portions of the wreck from the beach, and deemed that not much more could be done (Henry and Watkins-Kenney 2010).

On March 21, 2010, local resident and collector Midgett, again expressed outrage that state and county governments and Currituck County were ignoring such an important wreck and letting it be destroyed by the elements. Senator Basnight and Currituck County Commissioners were contacted and presented with a demand asking why the wreck couldn't be saved. On March

24, Pres. Pro Tem's Office contacted the NC DCR's Deputy Secretary to see if any action in relation to the wreck was planned. The North Carolina Wildlife Resources Commission (WRC) was interested to provide engineering expertise but as they had no experience in removing or maintaining a wreck, recognized a need to work with A&H to achieve this. The Head of A&H's OSA/UAB team agreed that as this was possibly the oldest shipwreck yet found in North Carolina and given its historical significance every effort should be made to remove the structure from the beach. Even if long-term preservation were not possible this action would at least provide an opportunity to properly study and document the wreck. Two possible spots for its location once recovered from the beach were identified: the grounds of a WRC property or at Currituck Lighthouse, where it could be stored, documented and perhaps even eventually displayed. The latter site was eventually chosen.

A&H archaeologists were available to assist the move but did not have funding or equipment to lift and move a structure weighing an estimated 10-15 tons. Further liaison between DCR Deputy Secretary, Pres. Pro Tem's Office, the WRC and A&H/OSA/UAB led to an offer from the WRC Executive Director on March 25 to provide their Engineering Services Division's tractor/trailer and key staff, including a construction crew supervisor and a truck driver. The DCR Deputy Secretary accepted the offer and confirmed that the A&H OSA/UAB Head would be DCR's point person in liaison with WRC to plan and implement the wreck's recovery from the beach. The Currituck Lighthouse Manager, local fire officers, and CAMA officers were also included in planning and implementing the recovery operation (Henry and Watkins-Kenney 2010).

March 31, 2010, it was reported to A&H that the wreck had moved again, a mile to the north, and was now higher up the beach. On April 1, plans were finalized and a detailed schedule

agreed for recovery of the wreck to start Monday April 5. Teams would arrive at site, set up equipment, and begin sand removal from around the wreck from 1pm to 4.30pm. Tuesday April 6, work would start at 6.15am with the move beginning at 8.18am at low tide. The ship was to be lifted onto a sled and towed up the beach to the lighthouse. Operations were to be completed by 12.00 pm and lunch served (Watkins-Kenney and Henry 2010).

On schedule, the wreck was successfully moved from the beach to the shade of an oak tree near the lighthouse. Over 20 local residents and volunteers helped remove sand from the wreck, including fire department staff with water from fire hoses used to wash sand off the wreckage. Under guidance of A&H staff, lifting and moving the remains was achieved through combined equipment and expertise of WRC engineers and the Corolla fire department. Over 100 people watched and cheered as the wreck was moved (Hampton 2010b). In reporting the event to the DCR Secretary, the Manager of the Lighthouse wrote: “No one in charge had experience with doing something like this and rather than turning into an "I know more than you" contest or the blind leading the blind, everyone's expertise shone through...Getting to work with the Underwater Archeology team, which I'm sure you know is a dream team, and incredible able engineers was a pleasure for all” (Henry and Watkins-Kenney 2010).

Removal of the wreck from the beach, however, was only the start of the work for A&H. Arrangements had to be made to get the wreck rapidly and thoroughly recorded and documented, as the timbers left uncovered were already drying and shrinking. East Carolina’s Department of History Maritime Studies Program faculty, staff and students began to record and digitally document the wreck in May 2010 (Brown 2013:49-54). ECU Maritime Studies student Daniel Brown, then undertook further investigation of the wreck for his Master’s thesis research (Brown 2013).

Discussions were held between A&H, Currituck County Manager and commissioners, and the Manager of the lighthouse, as to where to house the wreck in the long term and how it might be stabilized, conserved, protected and displayed. Finally, it was agreed that it should be moved to 90 miles south to the A&H's Graveyard of the Atlantic Museum (GOAM) in Hatteras. This move required further planning, co-coordinated by A&H archaeologists and was successfully achieved overnight at the end of July 2010 (Hampton 2010c). The wreck was placed on a concrete plinth outside the museum and over the following months options for its conservation were investigated and discussed (Hampton 2011, 2012). No conservation work, however, has been undertaken nor as far as the author is aware is any planned. The remains are not at present on public display, although they are accessible to researchers.

Since it was first observed on Corolla beach in 2008, the wreck remains became increasingly disarticulated and dispersed, worked over by members of the public, and damaged during removal operations (Brown 2013). Following removal from the beach and without cover, the timbers continued to shrink and warp and the hull underwent further collapse. On its concrete plinth outside the museum the wreck remains, possibly those of HMS *John* (1652), are unprotected, open to the elements and continued to deteriorate (Hampton 2015). With no plan developed nor funding appropriated for conservation, none has been undertaken. In Brown's view, as a management case study, "...the Corolla Wreck is unfortunately a classic example of failed site management and proves that archaeologists and cultural resource managers are not always up to the task of protecting every site" (Brown 2013:201).

Categorizing Archaeological and Conservation Actions Taken for Six UCH Sites

Of 953 UCH sites listed in the 2011 *Sites Database* approximately 58% had references listed in the 2016 *Bibliography*. There were 808 UCH sites in OBX counties listed in the *Sites Database* but references for just 508 (63%) were found in the 2016 *Bibliography* (Table 6.2) For the 808 UCH sites in OBX counties the maximum level of archaeological action for 432 (53%) was Level I – Survey; for 62 (8%) Level II – Investigation; for 14 sites (2%) Level III – Mitigation. As 300 (37%) had no reference it was not possible to determine levels of action for these sites by this methodology. Six UCH sites (Table 6.6) were selected for further investigation by selection criteria described in Chapter 2, and their conservation storylines constructed from literature and archive review.

In Chapter 5, five categories of possible *conservation actions* for UCH were identified from literature review: *conservation ex situ* (C5), *reburial* (C4), *active conservation in situ* (C3), *passive conservation in situ* (C2), and *conservation by record* (C1) (Table 6.5). For each of the six UCH sites investigated the total number of conservation actions taken were determined from literature and archive review, and database searches. An overall conservation rank number for each site was calculated as the sum of conservation actions taken; for example, for *Queen Anne's Revenge* the conservation rank number was 15, as conservation actions taken were $C1+C2+C3+C4+C5= 15$. The six UCH sites were rank ordered 1-6 for total conservation actions with 1=low, and 6 = high (Table 6.). By this method most conservation actions were taken for *Queen Anne's Revenge* (RO=6) and least for the “George Browne” wreck (RO=1).

Conservation Options:		No Action	Preserve by Record	Preserve In Situ (Passive)	Preserve In Situ (Active)	Recovery & Reburial	Preserve Ex Situ		
UCH Site	Year	C0	C1	C2	C3	C4	C5	C Rank #	C Rank Order
"George Brown" Wreck	2008-2017		*					1	1
USS <i>Huron</i>	1987-2017		*	*				3	2
CSS <i>Neuse</i>	1962-2017		*				*	6	3
<i>Modern Greece</i>	1962-2017			*		*	*	11	4
Lake Phelps Canoes	1986-2017		*	*		*	*	12	5
<i>Queen Anne's Revenge</i>	1997-2017		*	*	*	*	*	15	6

Table 6.7. Conservation Actions, Conservation Rank Number, and Conservation Rank Order for Six UCH Sites in North Carolina 1960-2017 (Data sources: see Chapter 9; table by author).

Factors Influencing Conservation Actions

From literature review and archive research, conservation storylines for the six UCH sites were constructed, from which six factors identified by the author as influencing archaeological and conservation actions taken in each case were: *weather, technological developments, government framework, resources, time, and people's interest.*

Weather events – including hurricanes, storms, floods and drought –variously led to the exposure, discovery, and threatened sites' existence. Storms, generating wave depths to remove overlying sediments, for example, led to exposing portions of the inner hull and cargo of *Modern Greece* (Ash Wednesday storm in 1962) and the main rubble mound of *Queen Anne's Revenge* (hurricanes Bertha and Fran in 1996). Storms have threatened sites post discovery, in situ and ex situ. For example, at *Queen Anne's Revenge* during the 1999 hurricane season scouring exposed hull timbers and prompted a rescue recovery operation. Repeated flooding of the CSS *Neuse* facility at CSS *Neuse* Caswell Memorial Historic Site through the 1990s precipitated moving the vessel eventually to better facilities, but not until in 2012. In the case of Lake Phelps canoes, the weather-related events were drought and taking water from the lake to combat fire, which lowered the water table and lake surface level such that canoes became clearly visible.

Technological developments influencing actions taken have ranged from advances in diving technology (as in case of *Modern Greece* in 1962-1963) to conservation developments - for example, the sucrose treatment of the recovered Lake Phelps canoes, for which a

methodology had just been published in 1985 (Parrent 1985; Bright 1987; Watkins-Kenney 2008).

Government framework as a factor influencing actions taken included establishing and enabling legislations (federal and state) by which: public policy for UCH and A&H's implementation responsibility and tasks were defined generally, as well as in particular for the six UCH case study sites. This included for resources through appropriations. The state government and organizational framework for A&H as context within which public policy for UCH in North Carolina is implemented are further described in Chapters 8 and 9.

Resource availability, including funding (state appropriations), facilities, equipment, and professional staff (archaeologists and conservators) influenced conservation actions taken for the six case study sites. Discoveries of three sites, *Modern Greece*, *CSS Neuse*, and *Queen Anne's Revenge* precipitated appropriations that enabled establishment of separate A&H facilities tasked with conserving artifacts from underwater environments – the Preservation Lab adjacent to Fort Fisher Historic Site, in 1963 and the *Queen Anne's Revenge* Archaeological Conservation Lab (QAR Lab) at East Carolina University's (ECU) West Research Campus (WRC) in Greenville in 2002-2003, through a partnerships agreement between A&H and ECU. State appropriations enabled high levels of conservation actions for *CSS Neuse* and *Queen Anne's Revenge*. There have been no state appropriations forthcoming for the "George Browne" Wreck and no conservation has been undertaken by A&H, other than facilitating its conservation by record by ECU Maritime Studies program faculty and students.

Time, as a factor influencing conservation decisions, was both a factor of the moment, as well as over the long-term. For *Modern Greece* and *CSS Neuse*, these "moments" were the 100th and 150th anniversaries of the Civil War. Both sites came under A&H management during

centennial fervor and interest. In 2014, CSS *Neuse* finally reached the display environment that professionals (conservators, archaeologists and museum curators) had been advocating for since its recovery from the river in 1965. Sesquicentennial focus also prompted A&H staff with the help of ECU Maritime Studies students and staff to clean, inventory, and assess the condition of *Modern Greece* artifacts in wet storage since the early 1960s (Grieve 2011).

For creating USS *Huron*, as the state's first shipwreck preserve in 1991, the moment was prompted by the 1987 Abandoned Shipwreck Act under which states were encouraged to create such parks and facilitate more public access to UCH (Lawrence 2003). For the four identified shipwrecks in this study, none were unknown at the time they became A&H's management responsibility – their histories and locations were all at least generally known. For example, in the case of *Queen Anne's Revenge* although grounded and abandoned in 1718, time as an influencing factor is long-term in that pirates and particularly Blackbeard, have long been and still are integral to the psyche, lore, and history of the people of North Carolina's coastal region. Time into the future is also a factor for the long-term conservation actions as all of the six UCH sites were ongoing projects as at end of 2018.

People - particularly local residents have influenced conservation actions for the six sites taken by A&H staff together with many partners and volunteers over the years. This was especially evident in following the conservation storyline of CSS *Neuse*, for which there was persistent local resident interest in and advocacy from Kinston. The vessel remains are in the town close to where it was constructed and then abandoned. Its presence in the Neuse River at Kinston was never forgotten nor its location lost. Its recovery from the river from 1961-1964 was initiated by local residents. Post-recovery it has remained in Kinston. Its conservation, exhibition and public accessibility since the mid-late 1990s are regarded as a key component of local efforts

to rescue Kinston from economic decline and weather caused destructions. For *Modern Greece*, although there was initially in 1962-1963 very high levels of public interest there is no local *resident population* at Fort Fisher, Kure Beach, to advocate in the long term for its continuing conservation – at least not in the way residents of Kinston have done for CSS *Neuse*.

For Lake Phelps canoes at Pettigrew State Park, there is no local resident population advocating for their conservation and display. For the “George Browne” Wreck initial local public pressure from one or two influential people to “save” the wreck resulted in its removal from the beach. Post-recovery, however, this interest and advocacy for its conservation and display has not been sustained. This may in part be due to removal of the wreck remains from Corolla Beach to the Graveyard of the Atlantic Museum at Hatteras, some 90 miles away. They are not being conserved and are not on public display. It is possible that the local resident population at its new location in Hatteras is not even aware of its existence, let alone advocating for its continued conservation.

The highest level of conservation actions has been for *Queen Anne’s Revenge*. Conservation of artifacts recovered from the wreck is undertaken at the A&H/OSA QAR Lab located at East Carolina University (ECU) home of the “Pirates” in Greenville. For Greenville and ECU, their involvement and support for conservation and investigation of the remains of Blackbeard the pirate’s flagship was evidenced through city and university events to celebrate “Blackbeard 300 1718-2018”. The NC Maritime Museum in Beaufort is the designated long-term repository for the artifacts and location of their permanent display. Beaufort also identifies with the remains and their presence there in the museum provide a source of pride to local residents; the town and museum promote themselves as the “home of *Queen Anne’s Revenge*”.

Summary

This chapter described archaeological and conservation actions taken by A&H for UCH in general and for six case study sites in particular since the 1960s to understand how conservation of UCH has been managed (RQ2), what actions have been taken, and what factors influenced those actions. To characterize actions taken for UCH sites in Coastal Plain Counties, the author undertook a critical discourse analysis of references in the 2016 *Bibliography* (NC A&H/OSA/UAB 2016) in combination with information in the 2011 *Sites Database* (NC A&H/OSA/UAB 2011).

Management decisions for conservation actions for UCH likely depend on a combination of factors at a particular moment as well as over the long term. Influencing factors may not only be the condition and threats to a site but also on different people's interests in it. Three groups of people (public, political, and professional) have been identified as involved variously as players at all stages of the public policy process (Kingdon 1995, 2003; Kraft and Furlong 2007). The third research question (RQ3) for this study was: How do levels of players' interest in UCH influence and correlate with each other and with conservation actions over time? Towards understanding this, the author investigated total levels of interest of each of these player groups in history, remains of the past, UCH in general, and the six sites in particular. Findings are described in the following three chapters (7, 8, and 9). In Chapter 10, results are described from the author's analyses of players' interests over time, correlation with each other, and with conservation actions for the six UCH sites. Also reported are results of analyzing data from the perspectives of three public management systems models, to answer the fourth research question (RQ4) of this study: What is the nature and behavior of A&H as an organization in general and of the six UCH projects; can they be characterized as traditional or complex systems?

CHAPTER 7

PUBLIC INTEREST IN NORTH CAROLINA'S HISTORY,

REMAINS OF THE PAST, AND UCH

“The people of North Carolina are realizing more and more every day that it is not safe to trust the future to the control of a people who are ignorant of their past; and that no people who are indifferent of their past need hope to make their future great. But even when this lesson is fully realized it will be valueless unless steps are taken at the same time to preserve the material from which that past is to be made intelligible to the present and to the future” (NC Historical Commission (1907:3).

Introduction

In North Carolina, there has been *public interest* in the state's history and physical remains of its past since at least the end of the 19th century (Wegner 2003; Powell 1989). This chapter describes the results of the author's investigation of levels and types of *public interest* in North Carolina for history, remains of the past and UCH generally since the early 1960s, and in relation to the six UCH case study sites in particular. In this chapter analyses of period totals for indicator data collected are described. Results of analyses of changes over time in public interest are reported in Chapter 10.

Data was collected for two indicators of *public interest: reading public interest* and *visiting public interest*. Indicator data for *reading public interest* were numbers of relevant articles found for keyword searches of the *America's News* (AN 2017) and *America's News Historical and Current* (ANHC 2018) online databases. Indicator data for *visiting public interest* were numbers of visits to sites and associated state attractions (ASAs). Sources for which data were: *North Carolina Visitor Profile Reports* (NC DTFSD 2011-2014; NC VP 2015), *Archives and History Biennial Reports* (NC A&H 1907-2014), and *North Carolina Program Evaluation Division Report on State Attractions 2010-2011* (NC PED 2012). Data as collated by the author from these sources for visit numbers as described in this chapter are listed in Appendix C.

Reading Public Interest: in History and UCH in North Carolina

To investigate what aspects of history and UCH in general, the *reading public* in North Carolina might be interested in, the author in 2017 undertook a critical discourse analysis of news articles in North Carolina sources by querying the then *America's News* (AN 2017) online database. Numbers of relevant articles found for all text keyword searches were assumed to be indicators of levels of *reading public* interest in the topic in that the news media would not publish a story if it thought there would be no public interest in it. Five sets of keyword searches were undertaken: history main set; history themes sub Set; history OBX set; historic sites set; and scuba Set. Keywords searched for each set were as listed in Table 7.1.

	Keywords				
History Main Set	history	museum	archaeology	cultural heritage	
History Theme Set					
People	public	professional	white	black	Blackbeard
	African American	Native American	slave	pirate	
Military	American Revolution	War of 1812	Civil War	WWI	WWII
Economy	cost	budget	tourism	economy	
Activity	education	research	science	preservation	protection
	discovery	conservation			
Place	in situ	maritime	underwater	shipwreck	ship
	treasure	artifacts			
Heritage	maritime heritage	submerged cultural heritage	underwater cultural heritage		
History OBX Set	New Hanover	Carteret	Brunswick	Pender	Onslow
	Craven	Pasquotank	Currituck	Perquimans	Camden
	Beaufort	Dare	Pamlico	Chowan	Gates
	Hertford	Bertie	Washington	Hyde	Tyrell
Historic Sites Set	historic site	Fort Fisher and Civil War	Brunswick and historic site	Somerset Place	Bath and historic site
Scuba Set	fishing	history	treasure	shipwrecks	wrecks
	archaeology	cultural heritage			

TABLE 7.1. Keywords searched on for indicators of levels of *reading public* interest – indicated by numbers of articles *America's News* (AN 2017) database. (Table by author).

At the time data was collected the earliest North Carolina sources in the database were from 1985, thus, data collected, analyzed, and as reported in this chapter were generally for the period from 1985 to 2014 inclusive. As of February 2017, there were 6,347,983 articles in 71 North Carolina sources from three source types (64 were newspapers, one newswire, and six web-only sources). For the same period in all USA sources there were in total 204,594,792 articles. For total numbers of articles 1985-2014, actual numbers are reported in this chapter.

Reading Public Interest: History Main Set Keywords: 1985-2014

The History Main Set’s keywords searched for were: “history”, “museum”, “archaeology”, and “cultural heritage”. Searches on keywords were done individually and in combination - for example “history” and “museum”. The keyword “history” occurred in a total of 486,974 articles, approximately 8% of all North Carolina news articles in the database over this period. Keyword “museum” occurred in just over 2% of all articles, and “archaeology” and “cultural heritage” each in less than 1%. Similar percentages of articles for each of these keywords were found in all US articles (Table 7.2).

Keyword	No. Articles NC	% All NC Articles	No. Articles US	% All US Articles
history	486,974	7.67%	15,909,238	7.78%
museum	140,717	2.22%	4,431,698	2.17%
archaeology	3,227	0.05%	112,707	0.06%
"cultural heritage"	1,950	0.03%	67,389	0.03%
Total No. all Articles	6,347,983		204,594,792	

TABLE 7.2. Actual total number of articles for main keyword searches for: history, museum, archaeology, and “cultural heritage” for North Carolina and US sources in *America’s News* database for 1985-2014 (Table by author, data source *America’s News* (2017) online database).

When history main set keywords “history” and “museum” were combined they yielded the most articles (50,617), approximately 10% of history total. Less than 1% of articles contained a combination of “history” and “archaeology”, or “history” and “cultural heritage”. The

combination yielding the fewest number of articles (29) was “archaeology” and “cultural heritage” (Table 7.3). In Figure 7.1 actual number of articles for history main set keywords in North Carolina sources are compared with those for all US sources.

Keyword in NC Articles	history	museum	archaeology	cultural heritage
history and	486,974	50,617	1,755	800
museum and	50,617	140,717	1,156	498
archaeology and	1,755	1,156	3,227	29
cultural heritage and	800	498	29	1,950
Keyword	history	museum	archaeology	cultural heritage
Total all NC articles 1985-2014	6,347,983	6,347,983	6,347,983	6,347,983
Total Keyword in all NC articles	486,974	140,717	3,227	1,950
Keyword % in All NC articles	7.67%	2.22%	0.05%	0.03%

TABLE 7.3. Actual total number of articles for combined main keyword searches (history, museum, archaeology, and “cultural heritage”) for North Carolina sources in *America’s News* database for 1985-2014. (Table by author, data source *America’s News* (2017) online database).

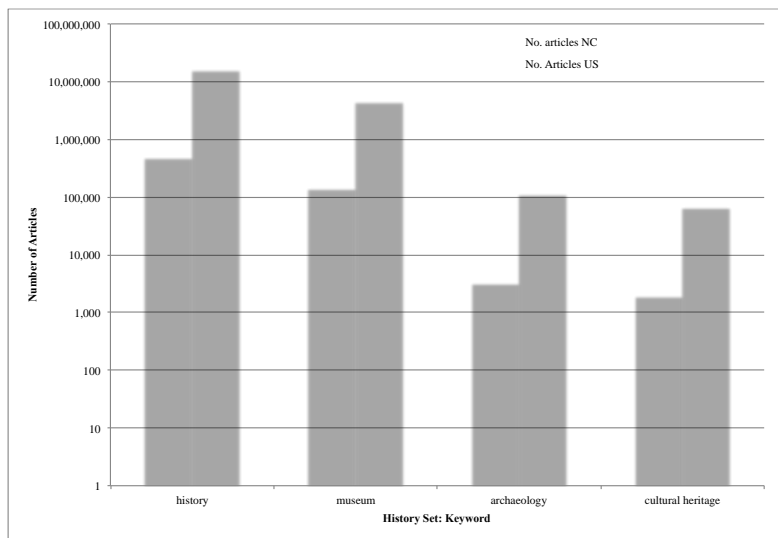


FIGURE 7.1. Actual total number of articles for history set keywords (history, museum, archaeology, and “cultural heritage”) in all North Carolina (blue) and all US sources (red) in *America’s News* database for 1985-2014 (Figure by author, data source: *America’s News* online database (2017)). (left column=NC; right column=US)

Reading Public Interest: History Theme Sub Set: 1985-2014

History sub set keywords (Table 7.1) were combined with history main set keywords for indications of areas of public interest in history related topics. The six theme headings were: people, military, economy, activity, place and heritage. Total actual numbers of

articles for each combination keyword search are plotted in Figure 7.2, as for example, “history” and “pirate”, or “museum” and “Civil War”.

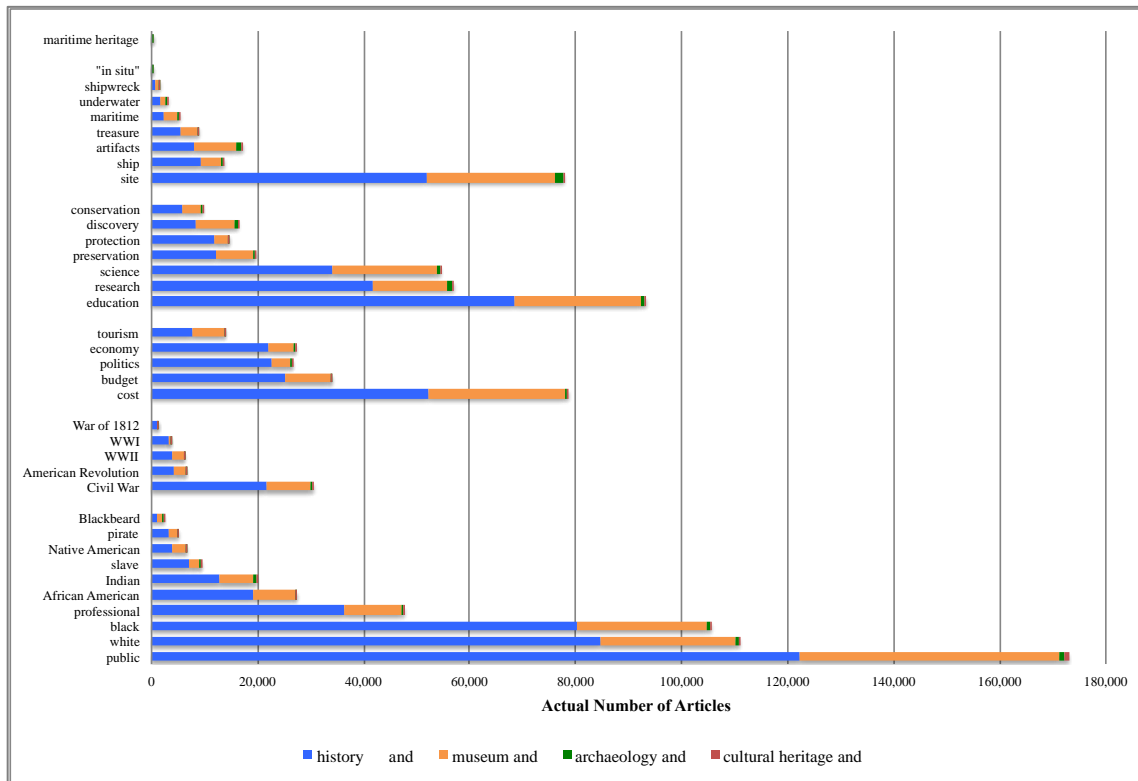


FIGURE 7.2. Actual numbers of articles in North Carolina sources 1985-2014, in *America's News* database for history set and history subset keyword searches. (Figure by author, data source: *America's News* online database).

For *people group* keywords, the combination of “history” and “public” yielded the largest actual number of articles (122,336). The combination of “cultural heritage” and “Blackbeard” yielded the smallest actual number of articles (3). “public” also yielded the most actual numbers of articles in combination with the other main keywords: “museum”, “archaeology”, and “cultural heritage”.

The total number of articles for combinations of history set keyword and theme set keyword was calculated as a percentage of the total number of articles for each history main set keyword only. Searches for main keywords and combinations with keyword subsets are not mutually exclusive and therefore proportions should not be aggregated to combine categories, as combined percentages do not equal 100 percent. The results for the *people group* are in Figure

7.3 (actual numbers) and in Figure 7.4 (as percentages of history main set keyword). As a percentage of the total actual number of articles for each of the main keywords, approximately 25% of all “history” articles also contained the word “public”. Approximately 35% of the total actual number of articles containing the other three main keywords also contained the word “public”. Theme Subset keywords “Blackbeard”, “pirate”, “Native American”, as a percentage of the total actual number of main keywords all occurred most in combination with “archaeology”, each approximately 7% of the total actual number of all articles for just “archaeology”.

For the *military group*, “Civil War” with each history main set keyword yielded most articles of each *military group* subset keywords (Figures 7.5 and 7.6). “Civil War” and “history” yielded most articles (21,575). “WWI” in combination with “archaeology”, with “cultural heritage”, and with “museum” yielded the smallest number of articles. As a percentage of total number of articles for main keyword only, “Civil War” and “archaeology” yielded the highest percentage of articles (almost 13%). “Civil War” and “museum” occurred in 6% of articles. As a percentage of the total number of articles for “cultural heritage” (1,950), “Civil War” and “cultural heritage” also occurred in about 6%.

For the *economy group* the keyword most frequently with history main set keywords “history” or “museum” was “cost”; for “cost” and “history” 52,314 articles; and for “cost” and “museum” 25,596 articles (Figure 7.7). “Cost” and “archaeology” occurred in 530 articles, and with “cultural heritage” in 209. As a percentage of total articles for a main set keyword only, “cost” occurred in most articles with “museum” (18%) and with “archaeology” (16%). With “cultural heritage”, “tourism” occurred in over 10% of articles (Figure 7.8).

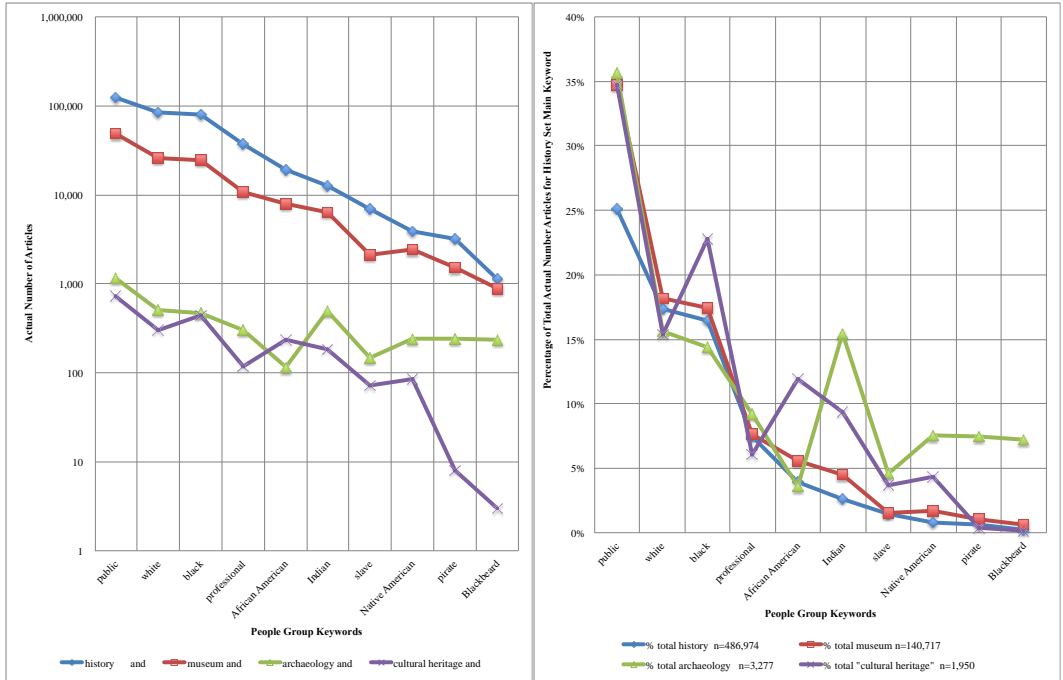


FIGURE 7.3 (left). People group: actual number of articles for history set and subset keywords.
 FIGURE 7.4 (right). People group: actual number of articles history set and subset keywords as percentage of total actual number history set keywords. (Figures by author, data source: *America's News* online database).

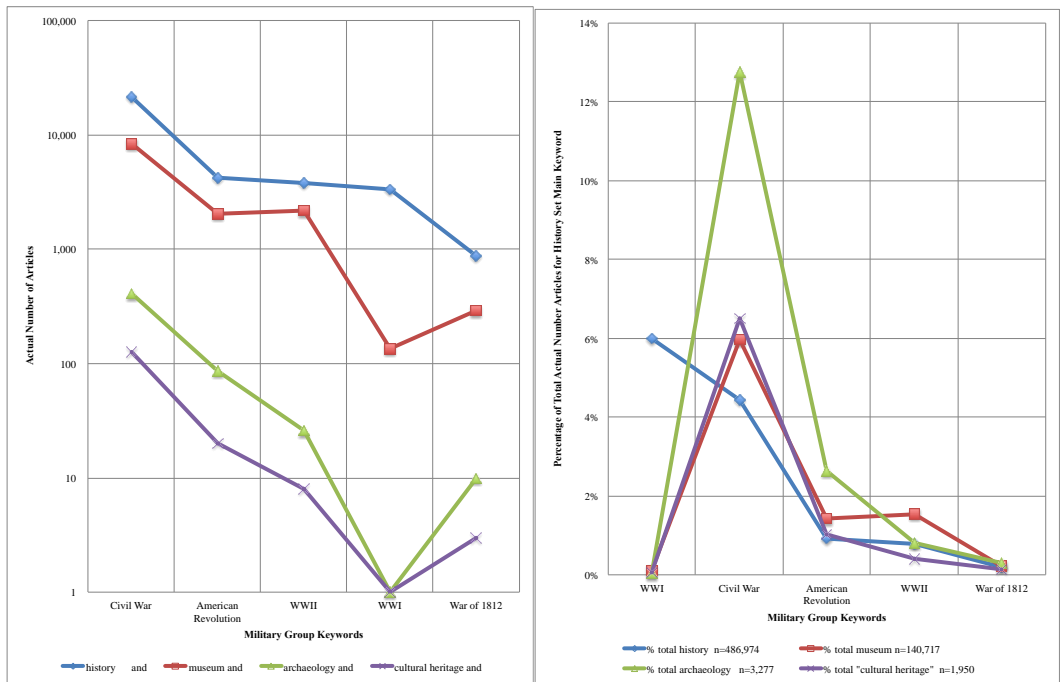


FIGURE 7.5 (left). Military group: actual number of articles for history set and subset keywords.
 FIGURE 7.6 (right). Military group: actual number of articles for history set and subset keywords as percentage of total actual number of articles for history set keyword only. (Figures by author, data source: *America's News* online database).

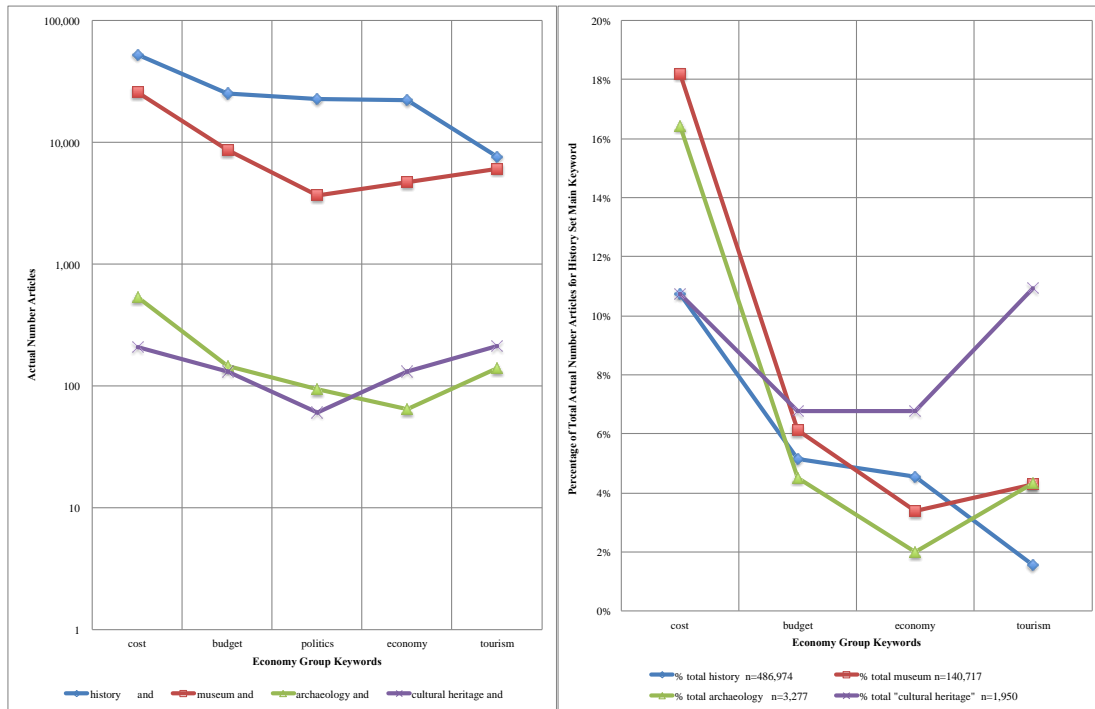


FIGURE 7.7 (left). Economy group: actual number of articles for history set and subset keywords.

FIGURE 7.8 (right). Economy group: actual number of articles for history set and subset keywords as percentage of total actual articles history set keyword only. (Figures by author, data source: *America's News* online database).

In the *activity group*, “education” was most frequent subset keyword, with “history” (68,456 articles) and with “museum” (23,924 articles) (Figure 7.9). As percentage of total articles for main keyword, “research” occurred most with “archaeology” - in almost a third of all archaeology articles. The lowest percentage theme keywords with “archaeology” were “preservation”, “protection” and “conservation” (Figure 7.10). “Protection” was the second highest percentage (19% of articles) of subset keyword occurring with “cultural heritage”.

For the *place group*, “site” yielded most articles with main set keywords (Figure 7.11). “In situ” yielded fewest articles with “history”, “museum” and “archaeology”, and zero articles with “cultural heritage”. Keywords most with “archaeology” were “site” (42%) and “artifacts” (31%). “Underwater” and “archaeology” occurred in 14% of “archaeology” articles, and “shipwreck” and “archaeology” in 8%. In 10 articles “underwater” and “cultural heritage” occurred, just 0.5% of all “cultural heritage articles” (Figure 7.12).

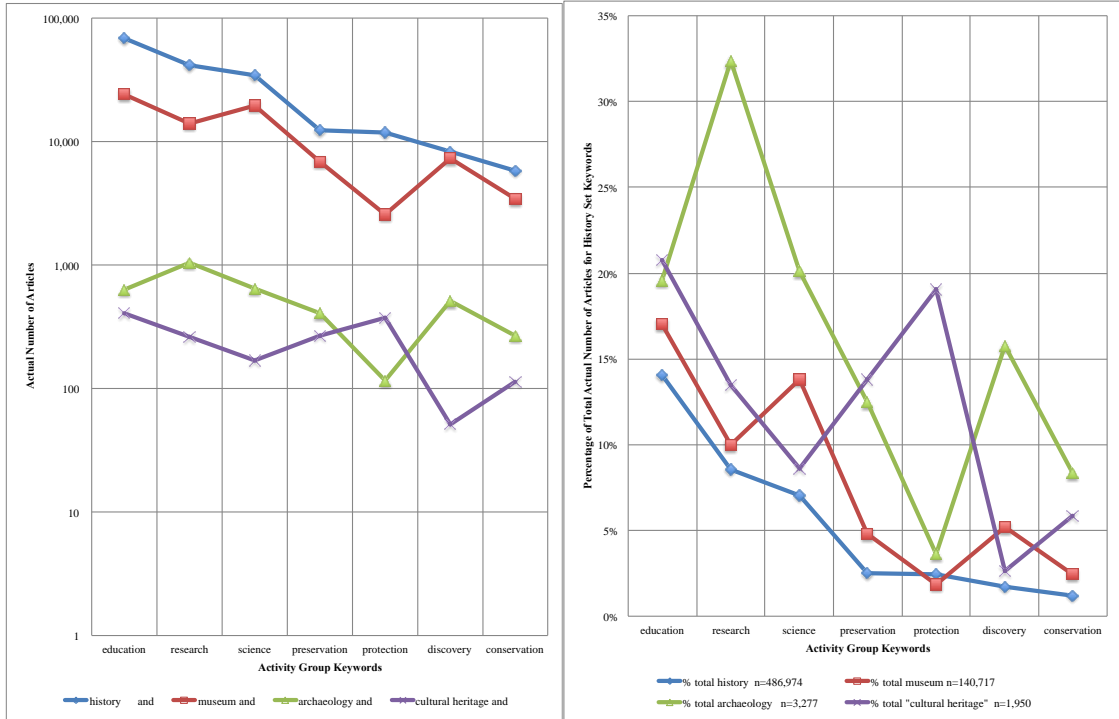


FIGURE 7.9 (left). Activity group: actual number of articles for history set and subset keywords.
 FIGURE 7.10 (right). Activity group: actual number of articles history set and subset keywords as percentage of total actual articles for history set keyword only. (Figures by author, data source: *America's News* online database).

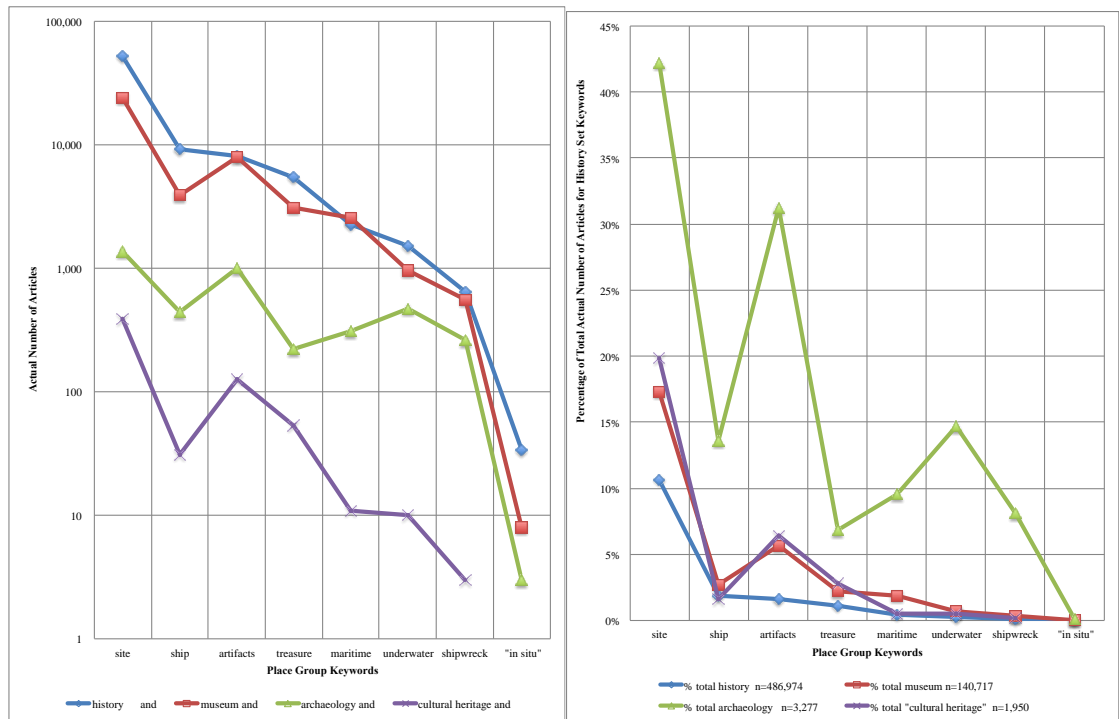


FIGURE 7.11 (left). Place group: actual number of articles for history set and subset keywords.
 FIGURE 7.12 (right). Place group: actual number of articles history set and subset keywords as percentage of total actual number history set keyword only. (Figures by author, data source: *America's News* online database).

Heritage group theme keywords were: “maritime heritage”, “underwater cultural heritage”, and “submerged cultural heritage”. For “maritime heritage” with “history” there were 96 articles, with “museum” 100 articles, and with “archaeology” 18 articles. There were *zero articles* for “underwater cultural heritage”. There were also zero articles found for “submerged cultural heritage”. By comparison in all US news sources, “underwater cultural heritage” was found in 66 articles of 200 million articles (Figure 7.13). The first occurrence was in 1996. There were most articles (22) in 2012. Keywords “underwater cultural heritage” occurred in sources in eleven states; most in Florida (9 articles) and Michigan (4 articles) (Figure 7.14). Although “underwater cultural heritage” did not occur in any news articles in North Carolina sources the search for “archaeology” and “underwater” did find a total of 475 articles.

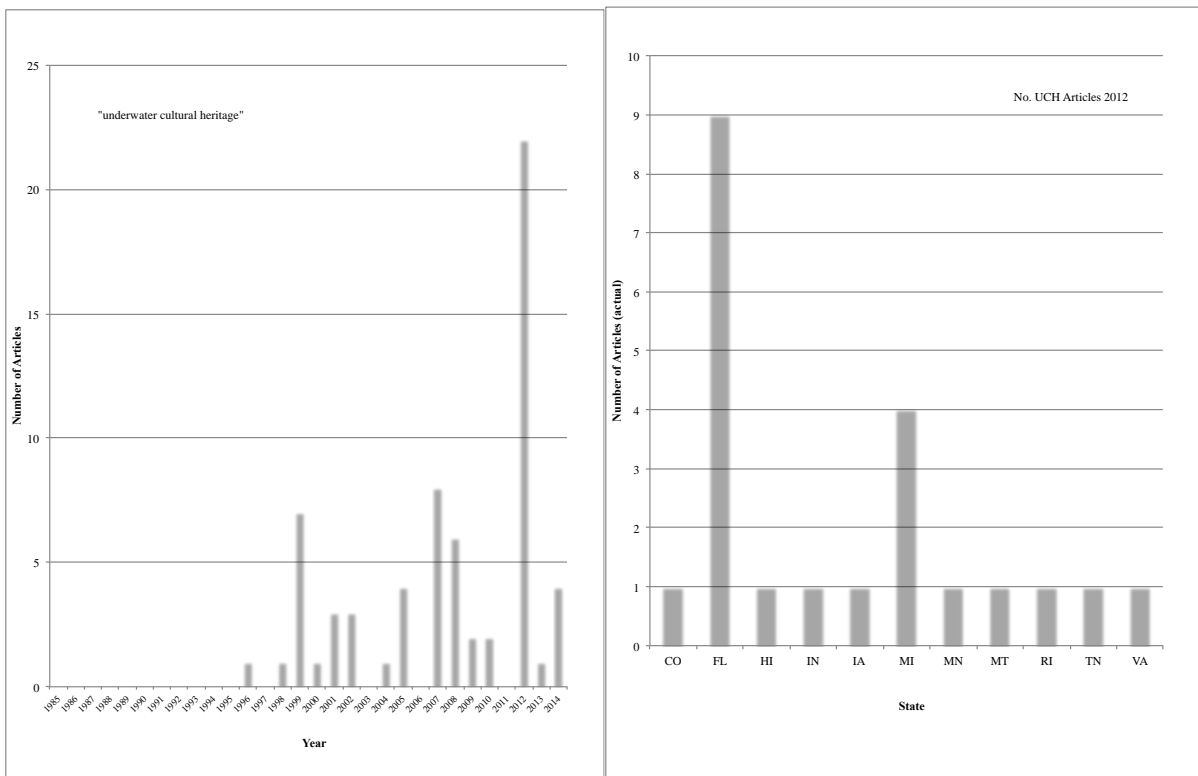


FIGURE 7.13 (left). Number of articles (actual) for keyword search on “underwater cultural heritage” 1985-2014 in all US articles for (total number of articles = 66).

FIGURE 7.14 (right). Number of articles by States for keyword search on “underwater cultural heritage” for 2012, in all US articles. (Figures by author, data source: *America’s News* online database).

Reading Public Interest: OBX County Set: 1985-2014

To investigate in which coastal counties there might be most reading public interest in “history”, “museum”, “archaeology”, or “cultural heritage” sources in the *America’s News* database were searched by these keywords and by OBX county names. OBX counties as defined for this study being those with an ocean or sound border. Total actual numbers of articles for each OBX county with history main set keywords are plotted in Figure 7.15. The most articles found were for “New Hanover County” (54,074) and the fewest for “Tyrrell County” (153). The greatest number of articles for all history set main keywords (“history”, “museum”, “archaeology”, “cultural heritage) were in combination with “New Hanover County” and the fewest with “Hyde County” and “Tyrrell County.”

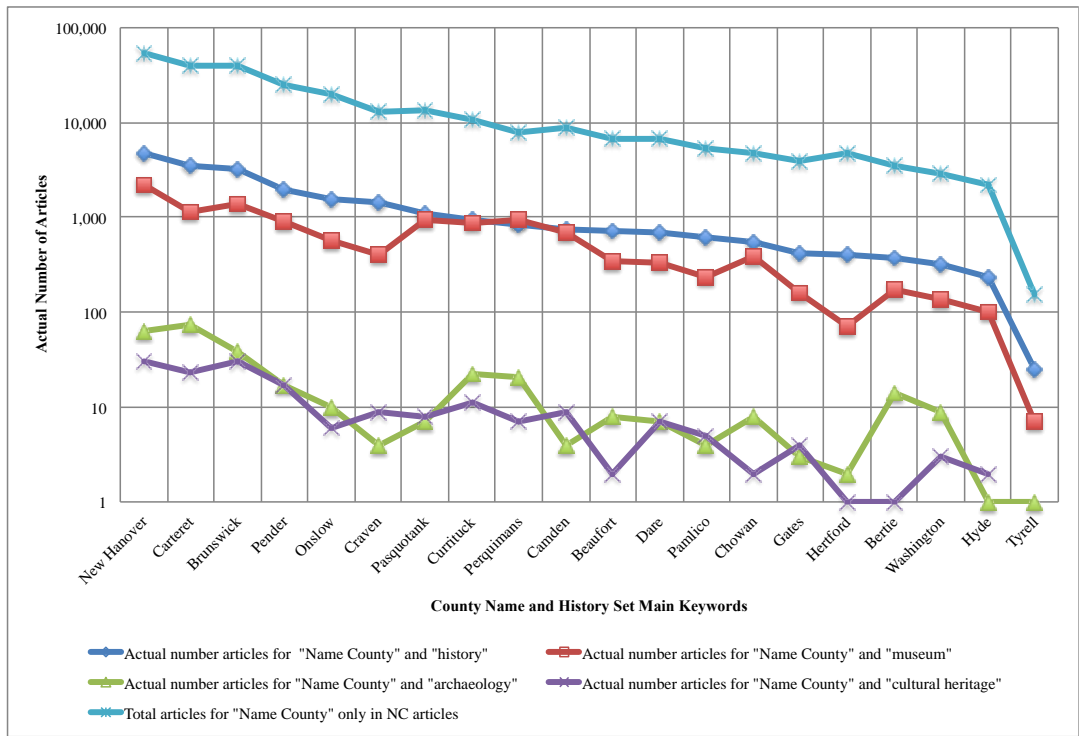


FIGURE 7.15. Total actual number articles for OBX county name and history set main keywords in all North Carolina articles 1985-2014. (Figure by author, data source: *America’s News* online database).

County names combined with “history” and “museum” yielded more articles than with “archaeology” or with “cultural heritage”. County names searched in combination with “archaeology” yielded more articles than with “cultural heritage”, except for Craven County, Camden, Gates, and Hyde. There were zero articles containing “Tyrrell County” and “cultural heritage”. As a percentage of total articles found on just a county name search, History Set keyword “history” occurred most in combination with “Tyrrell County” in just over 16% of articles (Figure 7.16). For all other county names, “history” occurred in between 8% and 12% of articles. As a percentage of total articles for each county name, “museum” occurred most in combination with Perquimans County (12%) and least with Hertford County (just under 2%). “Archaeology” and “cultural heritage” occurred in less than 0.5% of articles in combination with any of the county names (Figure 7.16).

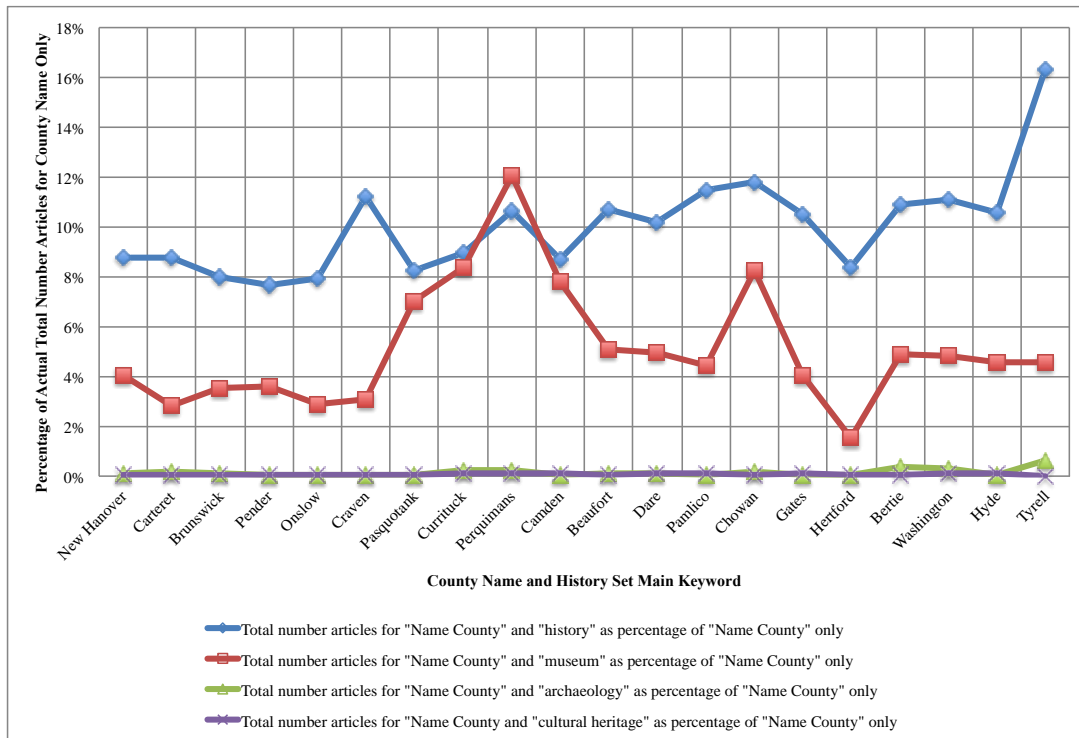


FIGURE 7.16. Percentages of actual number of articles for history set keywords and OBX county names of total actual number of articles for OBX county names only. (Figure by author, data source: *America’s News* online database).

Reading Public Interest: Historic Sites Set: 1986-2014

To investigate *reading public interest* in A&H managed historic sites associated with or at least geographically close to the six UCH case study sites, historic sites set keywords searched for were: “historic site”, “Fort Fisher” and “Civil War”, “Brunswick” and “historic site”, “Somerset Place”, and “Bath” and “historic site”. A search on keyword “historic site” yielded a total of 8,017 articles for all North Carolina sources in *America’s News* for the period 1986 to 2014; which was just 0.1% of the total number of North Carolina sources articles for this period (Table 7.4). Of the four historic sites searched for “Fort Fisher” in combination with “Civil War” yielded by far the most articles (1,337). Fewest articles (151) found were for “Bath” and “historic site”.

	Total Actual Number Articles	Percentage of all NC Articles
All NC Articles	6,803,896	100%
"historic site"	8,017	0.12%
"Fort Fisher" and "Civil War"	1,337	0.02%
"Brunswick" and "historic site"	459	0.01%
"Somerset Place"	210	0.00%
"Bath" and "historic site"	151	0.00%

TABLE 7.4. Total actual numbers articles for historic sites keyword searches and numbers of articles as percentage of all North Carolina Articles 1986-2014. (Table by author, data source *America’s News* (2017) online database).

Reading Public Interest: Scuba Set: 1985-2014

To investigate *reading public interest* in the underwater activity of scuba diving in combination with history and underwater remains of the past a keyword search of the *America’s News* database was made for articles containing keyword “scuba”, and “scuba” in combination with: “fishing”, “history”, “treasure”, “shipwrecks”, wrecks”, “archaeology” and “cultural heritage”. The period from 1985 to 2014, yielded 3,997 articles in all North Carolina sources, and 161,152 articles in all US sources (Figure 7.17). As a percentage of the total number of

“scuba” articles in North Carolina sources, “scuba” and “fishing” occurred in almost 18% of articles, but in fewer than 2% of articles in US sources. “scuba” and “history” occurred in almost 15% of scuba articles in North Carolina sources, but in fewer than 2% in US sources. In all US sources “shipwrecks” occurred in almost 20% of scuba articles, but in fewer than 3% of North Carolina “scuba” articles (Figure 7.18).

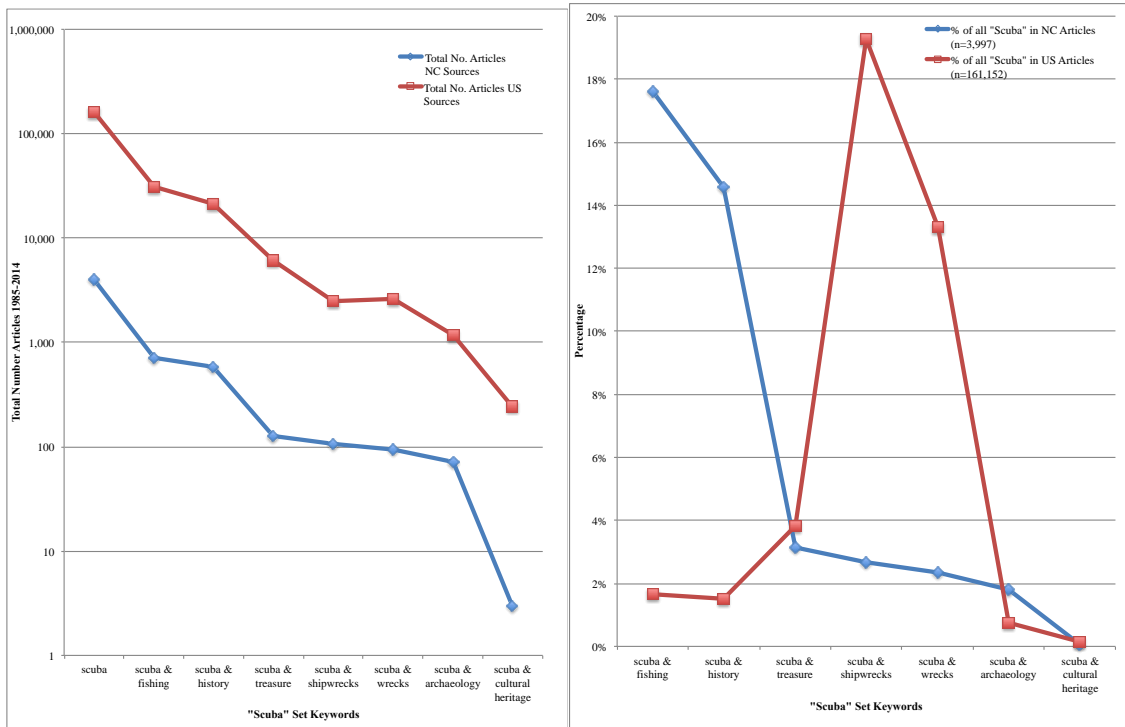


FIGURE 7.17 (left). Total number of articles for keyword search on “scuba” in North Carolina and US Sources 1985-2014.

FIGURE 7.18 (right). Total number of scuba and scuba subset keywords as percentage of total number of articles for “scuba” only, in North Carolina and US Sources, 1985-2014. (Figures by author, data source: *America’s News* online database).

Visiting Public Interest: in History and UCH in North Carolina

To understand *visiting public interest* in North Carolina’s history and UCH - as part of the context within which A&H implements public policy for the state’s UCH - the author first investigated from review of literature and reports the demography of the visiting population and types of visits made generally. Then data on numbers of visits made to A&H managed attractions associated with or close to UCH case study sites was collected.

North Carolina's Visiting Population

In 2010, North Carolina's resident population was about 9.5 million (US Census 2012), but its visiting population was approximately 36.8 million, of which 43% were North Carolina residents. By 2015, visiting population was approximately 54.6 million (NC VP 2015) with almost 50% from the State (Figures 7.19 and 7.20). In 2010, out-of-state visitors were mostly from other eastern seaboard states, including South Carolina (10.2%) and Virginia (9.0%). From 2010 to 2015, there were more overnight visits than day trips. In 2010, North Carolina residents made about 35% of the overnight visits, and about 40% of all overnight visits in 2015 (Figure 7.20). In 2015, there were over 40 million overnight visits and about 11 million-day trips made.

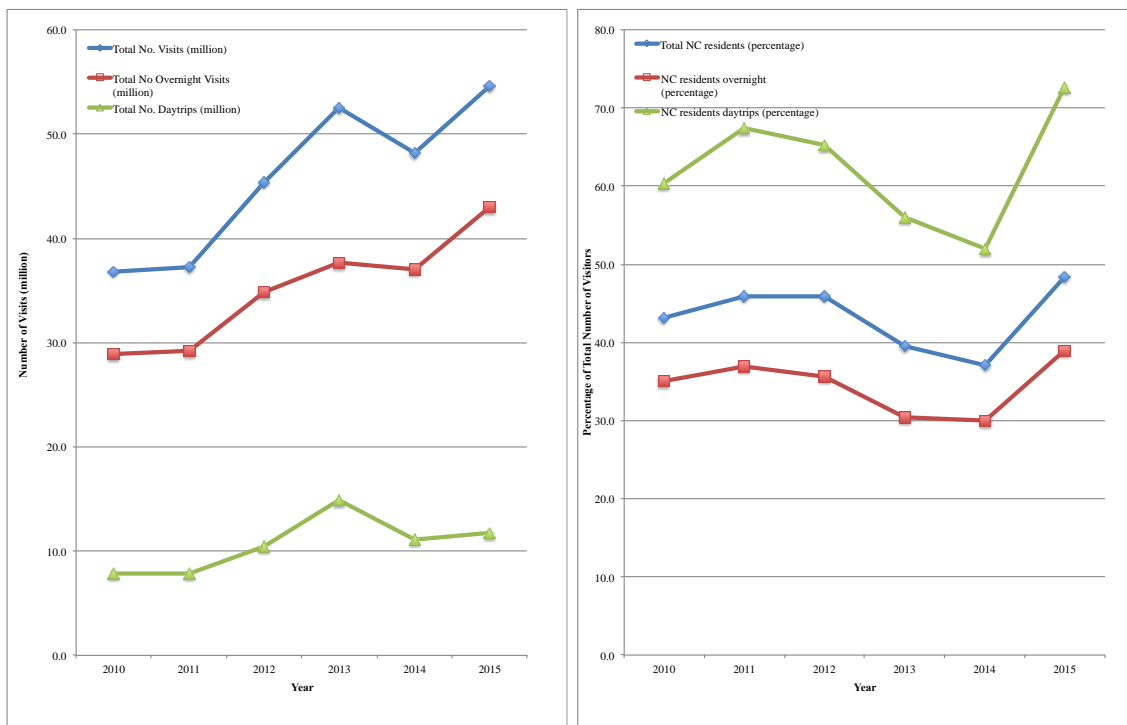


FIGURE 7.19 (left). Number of visitors to North Carolina 2010-2015 (total, overnight and daytrips).
 FIGURE 7.20 (right). Number of North Carolina residents as percentage of total, overnight and day-trip visits, 2010-2015. (Figures by author, data sources: NC DTFSD 2011-2014; NV VP 2015).

In 2010, the average visitor age of all visitors was 47, and over half were over 45 years old. Of overnight visits made approximately 62% of household heads had a college degree (NC DTFSD 2011:11-16). In each year 2010 to 2015, over 80 percent of all overnight and day-trip visitors were white. In all years, white visitors made more overnight visits than day-trips except 2012 when black visitors made more day-trips. (Figure 7.21).

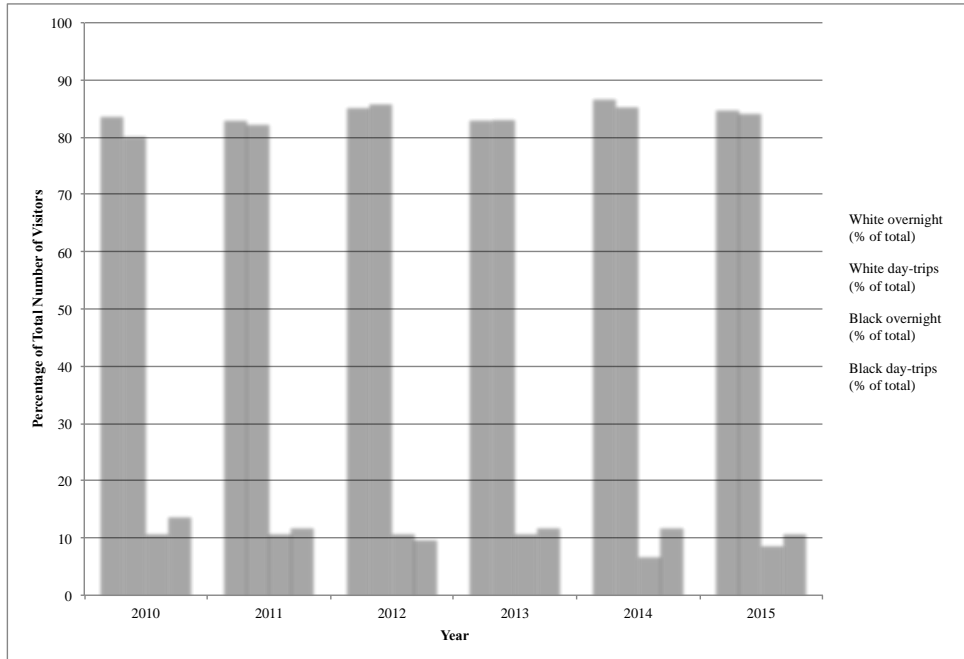


FIGURE 7.21. Overnight and day-trips by white and black visitors as percentages of total visits in North Carolina, 2010-2015. (Figure by author, data source: NC DTFSD 2011-2014; NC VP 2015). Columns left to right: white overnight; white day; black overnight; black day).

From 2010 to 2015, most visits made in North Carolina were for leisure rather than business reasons (NC DTFSD 2011-2014; NC VP 2015). The most popular leisure activities for overnight visitors were: visiting relatives, shopping, visiting friends, and the beach (Figure 7.22). Between 5% and 10% of activity visits were connected to history and remains of the past, for example visiting historic sites, churches, museums, old homes and mansions. Between 1% and 2% of visitors each year pursued activities related to the water, such as water sports (kayaking, canoeing), sailing, or jet skiing. Scuba diving and snorkeling were only listed as separate

activities in the 2014 and 2015 *Visitor Profile Reports*, with about 1% of visitors pursuing this activity each year – which would be about 370,000 visitors in 2014, and 430,000 in 2015.

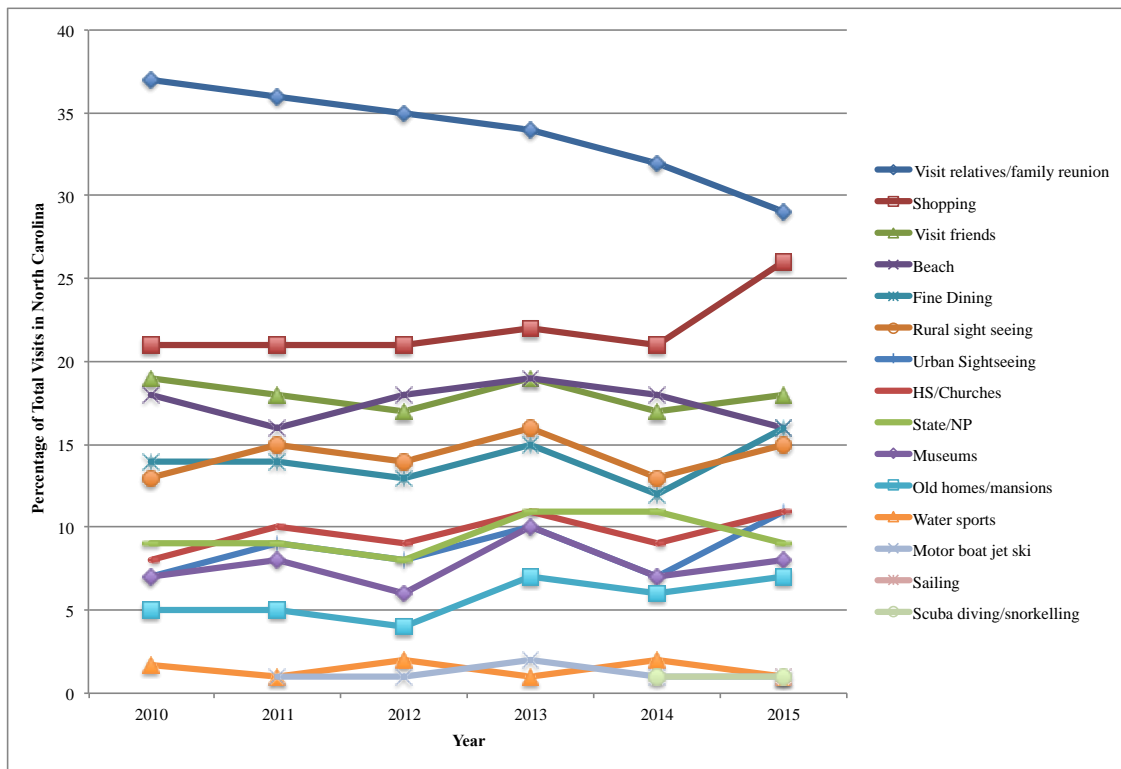


FIGURE 7.22. Overnight visitor activities 2010-2015 as percentages of total visits in North Carolina per year. As responses to questions on places visited and activities were not mutually exclusive percentages do not equal 100% and categories of activities cannot be aggregated (NC VP 2015:2). (Figure by author, data source: NC Visitor Profile Reports (2010-2015)).

Visiting Public Interest: Numbers of Visits to State Attractions: 2010-2011

In 2010-2011, the NC Program Evaluation Division (NC PED) reviewed state-run attractions managed by NC Department of Cultural Resources (NC DCR) or by NC Department of Environment and Natural Resources (NC DENR) including visitor numbers to each site (NC PED 2012). In 2010-2011, 76 (out of 81) state attractions, including state parks, historic sites, and museums, were open to the public and received in total over 20.5 million visitors (NCPED 2012). Visitor numbers to each of NC state attractions for 2010-2011 are plotted in Figure 7.23.

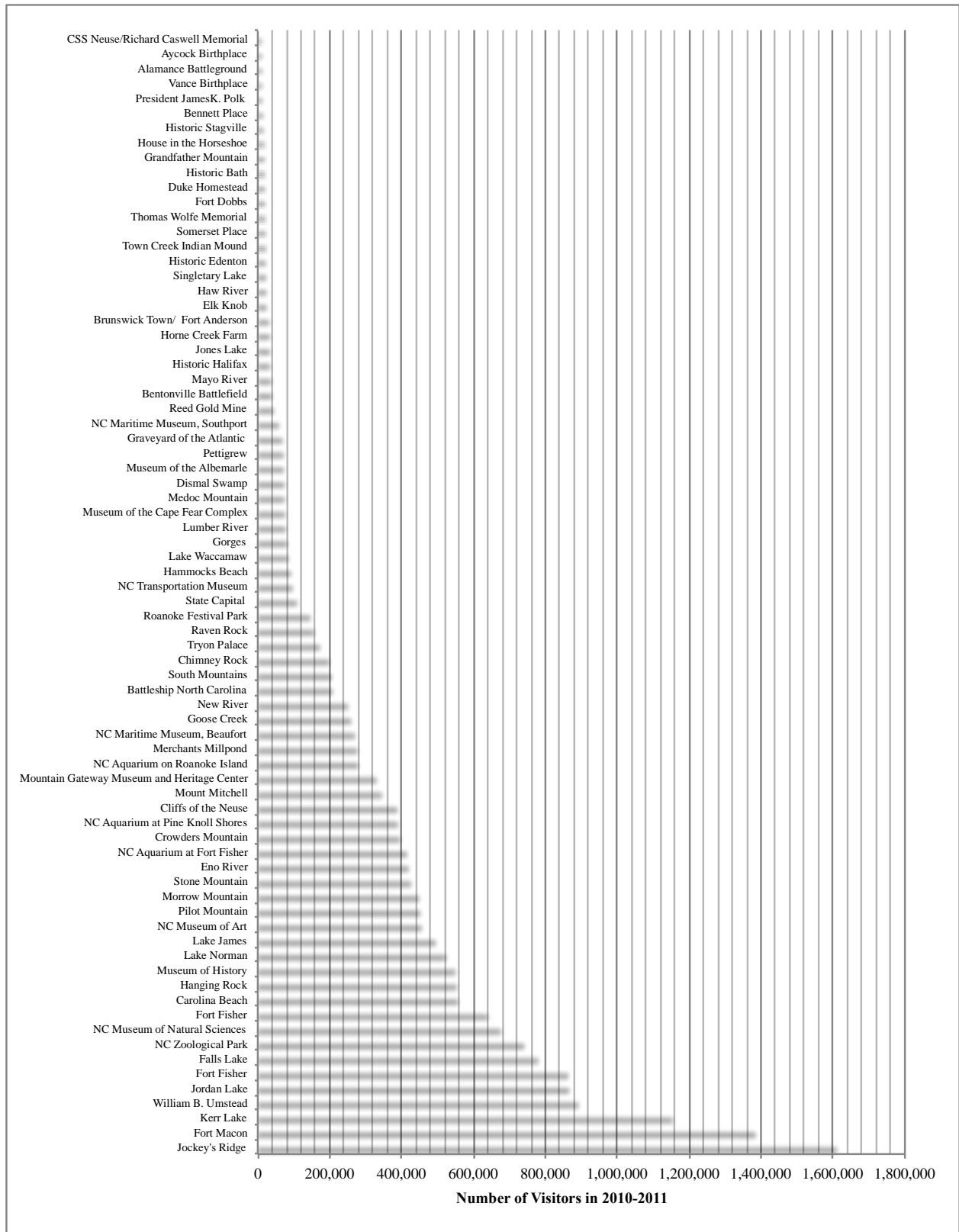


FIGURE 7.23. Numbers of visitors in 2010-2011 to North Carolina state attractions (NC DCR and NC DENR): state parks, museums, historic sites, commissions, aquaria, and zoo. (Figure by author, data source: NC PED 2012).

State attractions managed by DENR, included 39 state parks, three aquaria, a zoo, and the Museum of Natural Sciences. Within NC DCR, A&H managed 24 historic sites, 10 museums (including three maritime museums) and four commissions. The CSS *Neuse*/Caswell Historic site (A&H) received fewest visitors (about 10,000), and Jockey's Ridge State Park (NC DENR) had the most visitors (over 1.6 million) (Figure 7.23). In total 38 state attractions (A&H and NC DENR) were located in the 41 Coastal Plain counties and received about 8.5 million visits (43% of all visits to NC state attractions). In 2010-2011 the total resident population of all 20 OBX counties was just under 1.0 million (US Census 2012).

Twenty-five state attractions located in 13 of the 20 Coastal Plain OBX counties (Figures 7.24 and 7.25) received over 7.7 million visits, about 38% of all visits statewide (20.5 million). By comparison in 21 IBX counties approximately 1 million visits (5%) were made. A&H state attractions in nine OBX counties received a total of about 1.7 million visits. OBX counties with the most state attractions (NC DCR/A&H and NC DENR sites) were New Hanover and Dare, with five in each. Two of the sites in each county were A&H sites (Figure 7.25). All New Hanover County state attractions received about 35% of all visits to state attractions in the OBX counties in 2010-2011, and almost 50% of all visits to DCR sites. Seven counties (Hyde, Pamlico, Perquimans, Bertie, Currituck, Hertford, Pender) had no state attractions. Twelve DCR/A&H sites, in nine counties received approximately 35% of visitors to all OBX state attractions. Thirteen NC DENR sites, in eight counties received almost 5.5 million visitors (approximately 75% of visitors to all OBX attractions).

In seven counties (New Hanover, Craven, Carteret, Pasquotank, Dare, Chowan, and Washington) numbers of visits made to NC A&H sites was greater than their resident populations (Figure 7.26). New Hanover's resident population was 202,667 (about 20% of the

total OBX population in 2010). All NC A&H state attractions in the county received almost 850,000 visits. In 2010, Dare county’s resident population was 33,920 (US Census 2012). In 2010-2011 in Dare County over 1.8 million visits were made to all state attractions, of which 215,000 visits were to NC A&H sites.

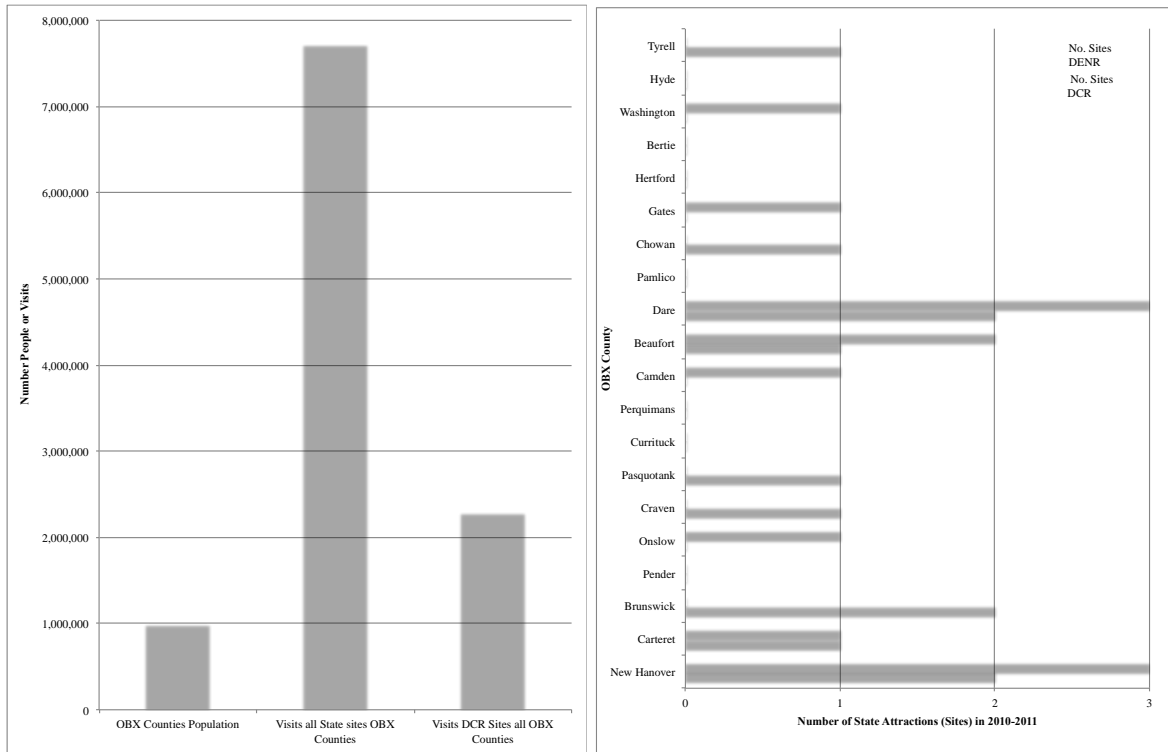


FIGURE 7.24 (left). OBX resident population and number of visits to NC DCR/A&H and NC DENR sites 2010-2011.

FIGURE 7.25 (right). Numbers of DENR and DCR/A&H state attractions in OBX counties in 2010-2011. (Figures by author, data sources: NC PED (2012); US Census (2012). (bars: per county lower bar = DCR; upper bar=DENR)

Five NC A&H historic sites in OBX counties received almost three-quarters of a million visitors; over 60% of all visits (1.17 million) to all state historic sites that year (NC PED 2012). Of total visits to all five historic sites, 88% (640,771) were to Fort Fisher (Table 7.5). Four museums in OBX counties received 470,136 visits, about 18% of all visits to DCR museums statewide. Three were Maritime Museums, in Beaufort (Carteret County), Southport (Brunswick County) and Hatteras (Dare County) (Table 7.6). The fourth was Museum of the Albemarle in

Pasquotank County. The Maritime Museum in Beaufort received almost 60% (270,532) of all visits made to OBX museums in 2010-2011.

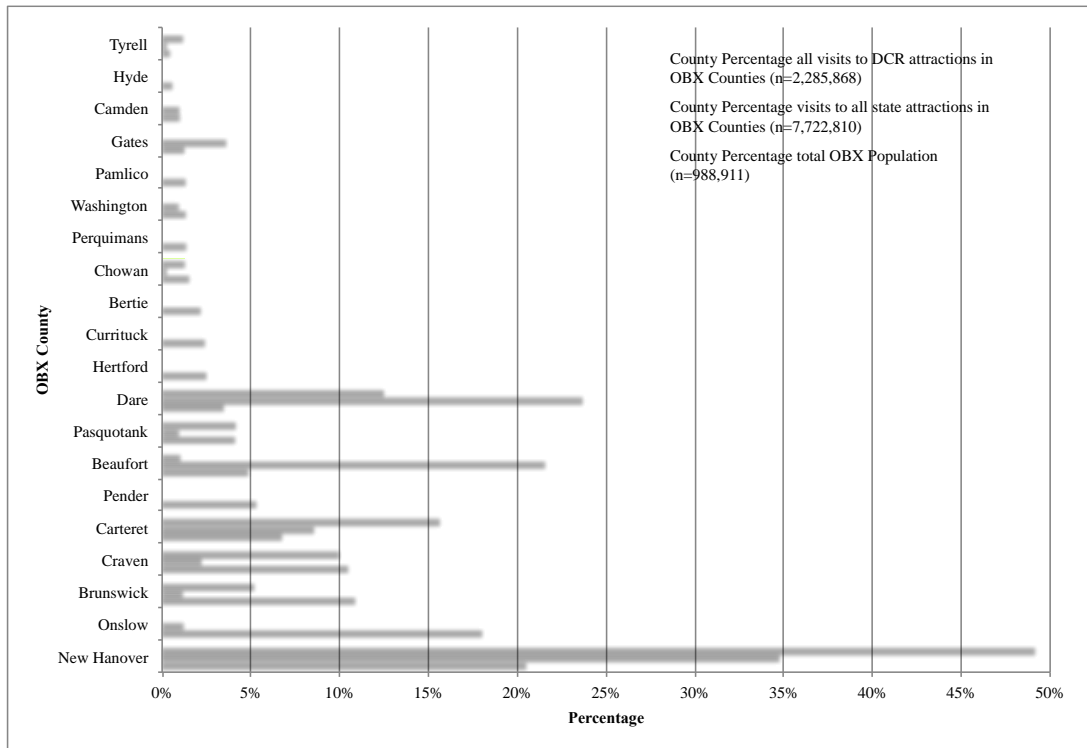


FIGURE 7.26. Numbers of visitors to state attractions in OBX counties compared to county populations in 2010 (Figure by author, data sources: NC PED (2012); US Census (2012). (per county: lowest bar=% visits per total OBX Pop; middle bar= % visits per all state attractions; top bar=% visits to DCR attractions)

OBX Historic Site	County	Number Visits to Historic Site	Percentage of total visits to OBX Historic Sites
Fort Fisher	New Hanover	640,771	88%
Brunswick	Brunswick	30,989	4%
Edenton	Chowan	22,252	3%
Somerset Place	Tyrell	20,260	3%
Bath	Beaufort	18,027	2%
Total		732,299	100%

TABLE 7.5. Public interest: numbers of visits to historic sites in OBX counties 2010-2011. (Table by author, data source NCPED 2012).

OBX State Museum	County	Number Visits to State Museum	Percentage of total visits to OBX State Museums
NC Maritime Museum, Southport	Brunswick	58,612	12%
NC Maritime Museum, Beaufort	Carteret	270,532	58%
Graveyard of the Atlantic Hatteras	Dare	69,164	15%
Museum of the Albemarle Elizabeth City	Pasquotank	71,828	15%
Total		470,136	100%

TABLE 7.6. Public interest: numbers of visits to state museums in OBX counties 2010-2011. (Table by author, data source: NC PED 2012).

Visiting Public Interest: Number of Visits to State Historic Sites in OBX Counties: 1960-2014

The state’s public agency for Archives and History (A&H) has managed historic sites since the mid-1950s (Wegner 2003; NC A&H 1958:15). Initially there were nine sites. By 2006, the Historic Sites Section was managing 27 sites (Figure 7.27). This was reduced to 23 in 2012.

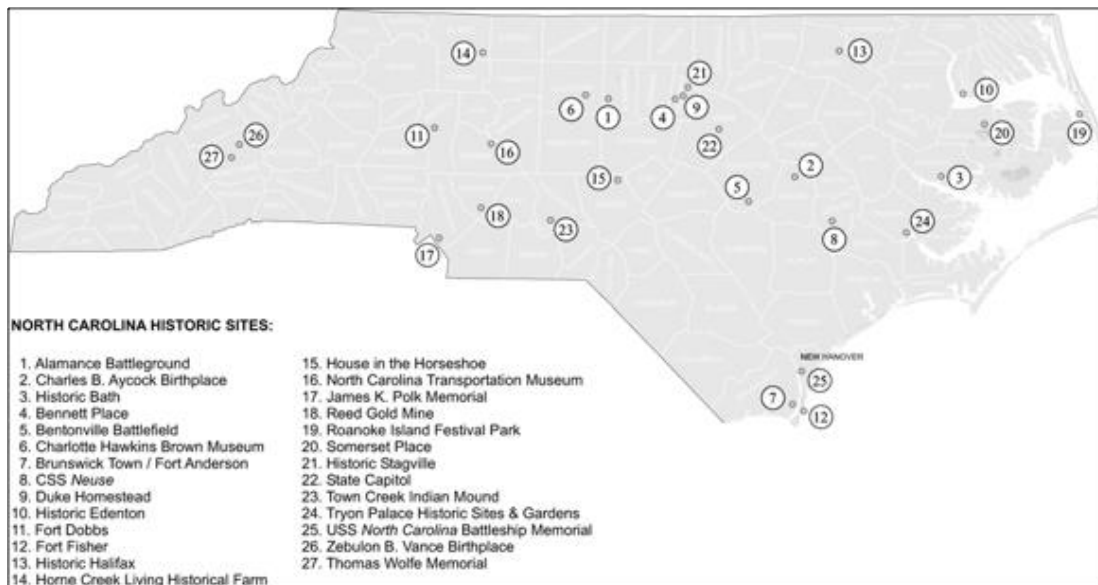


FIGURE 7.27. Locations of state historic sites (including four commissions). (Map by Mark Anderson Moore 2006, Courtesy NC Office Archives and History; <https://www.ncpedia.org/state-historic-sites-program>).

A&H Biennial Reports record attendance at historic sites at least from 1960.

Over five decades (1960-2010) all historic sites received in total almost 40 million visits. In 1960-1962, about 200,000 visits were made to the first nine sites. There were almost 2.4 million visits to 23 historic sites across the state in 2012-2014. From 1960 to 2010, 40% (almost 15.5

million) of visits to all historic sites in the state, were to four sites in OBX counties: 29% to Fort Fisher (New Hanover County); 6% to Brunswick Town (Brunswick County); 3% to Bath (Beaufort County); and 2% to Somerset Place (Washington County) (Table 7.7).

Year	Fort Fisher	Brunswick	Somerset Place	Bath	Total	No. visitors all HS Sites	Total visitors to 4 sites as % of total to all HS
1960-1970	1,367,224	468,934	17,133	72,997	1,926,288	3,367,808	57%
1970-1980	1,121,280	891,734	148,469	242,943	2,404,426	5,145,454	47%
1980-1990	1,432,643	557,807	103,426	296,260	2,390,136	7,339,427	33%
1990-2000	1,477,028	321,525	195,335	249,036	2,242,924	7,650,365	29%
2000-2010	5,972,068	240,888	142,965	166,018	6,521,939	15,533,267	42%
Totals	11,370,243	2,480,888	607,328	1,027,254	15,485,713	39,036,321	40%
% Total	29%	6%	2%	3%	40%	100%	40%

TABLE 7.7. Public interest: numbers of visits to four historic sites in OBX counties, and to all historic sites in North Carolina. (Table by author, data sources: Archives and History Biennial Reports 1960-2014).

From 1960 to 2010, Fort Fisher received in total over 11.37 million visitors, approximately 30% of all visits to state historic sites for the same period. In each decade, 1960-2010, Fort Fisher also received the greatest percentage of visits to all A&H historic sites in the state (Figure 7.28).

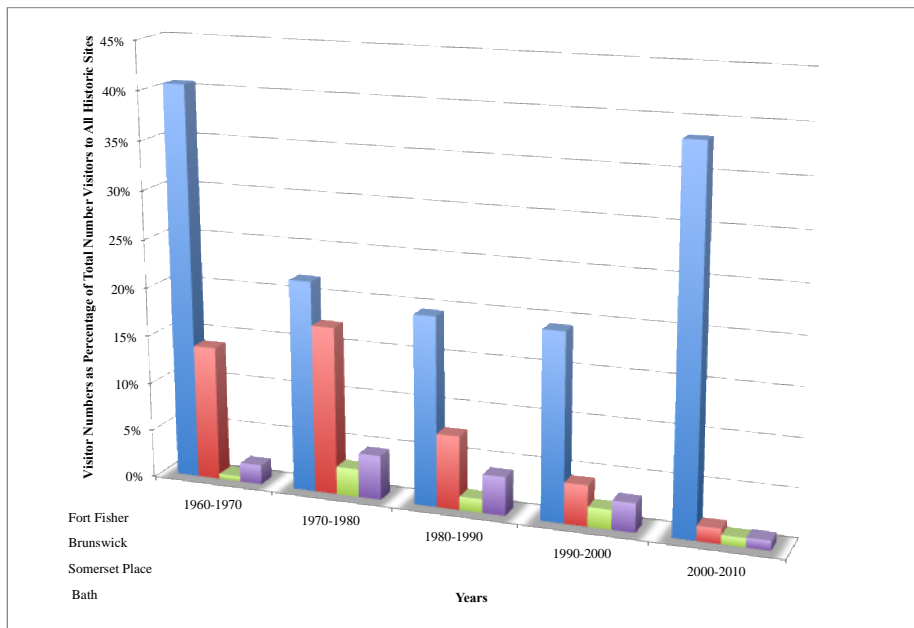


FIGURE 7.28. Decadal visitor numbers to historic sites (Fort Fisher, Brunswick, Somerset Place, and Bath) as percentage of total number of visitors to all historic sites in state, 1960-2010: 1960-1970 n=3,367,808; 1970-1980 n= 5,145,454; 1980-1990 n= 7,339,427; 1990-2000 n=7,650,365; 2000-2010 n= 15,533,267. (Figure by author, data sources: NC A&H Biennial Reports 1960-2010).

Since the 1960s, Fort Fisher historic site received the most visits of the four OBX sites, with over 1 million visitors per decade. In the 1990s, almost 1.5 million visits were made. From 2000 to 2010 almost 6 million visits. A&H has managed Somerset Place, since 1967 (NC A&H 1968:42). By 2010, it had received the fewest number of visits with a total of 607,328 visits. In 2010-2011 Somerset Place received 20,020 visits. By contrast, Pettigrew State Park, location of Lake Phelps, less than a mile away received 71,364 visits that year (NC PED 2012).

Reading Public Interest: Six UCH Sites and ASAs: 1960-2017 Period Totals

To investigate *reading public interest* in the six UCH case study sites and in associated state attractions (ASAs) the author made all text searches of the ANHC online database using keywords as listed in Table 7.8.

UCH Site	All Text Keyword Searches (main)
<i>Modern Greece (MG)</i>	"Modern Greece" and "Fort Fisher"
CSS Neuse (CSSN)	"CSS Neuse"
Lake Phelps Canoes (LPC)	"Lake Phelps" and "canoe"
USS <i>Huron</i> (USSH)	"Huron" and "Nags Head"
<i>Queen Anne's Revenge (QAR)</i>	"Queen Anne's Revenge"
"George Brown" Wreck Corolla Beach (GBW)	"Corolla" and "shipwrecks"
State Attractions (UCH Sites)	All Text Keyword Searches (main)
Fort Fisher Historic Site (MG)	"Fort Fisher State Historic Site"
CSS Neuse/Caswell Historic Site (CSSN)	"CSS Neuse State Historic Site"
Pettigrew State Park (LPC)	"Pettigrew State Park"
Jockeys Ridge State Park (USSH)	"Jockeys Ridge State Park"
NC Maritime Museum, Beaufort (QAR)	"North Carolina Maritime Museum Beaufort"
Graveyard of the Atlantic Museum (GBW)	"Graveyard of the Atlantic Museum"

TABLE 7.8. Keywords searched in all text searches of ANHC database for numbers of articles as indicators of levels of public interest, and of *Google Scholar* online, for levels of professional interest. (Table by author).

At the end of 2017 (as searched in March-April 2018) there were over 13 million articles in 87 North Carolina sources ranging in date from 1792 to 2017 in the ANHC database. There were over 9 million articles for the 57 biennial financial years from 1960/1961 to 2016/2017. A total of 1,779 articles for keyword searches relating to UCH sites were found as follows: 75 (4%) for *Modern Greece*; 476 (27%) for CSS *Neuse*; 18 (1%) for Lake Phelps canoes; 23 (1%) for

USS *Huron*; 1,149 (65%) for *Queen Anne's Revenge*. A search on keywords “Corolla” and “shipwreck” together found 38 (2% percent) articles. For six ASAs, in total 2,258 relevant articles were found. For Fort Fisher State Historic Site there were 909 (c. 40%); for CSS *Neuse* State Historic Site 118 (c. 5% percent); for Pettigrew State Park 237 (c. 10%); Jockeys Ridge State Park 522 (c. 23%); for North Carolina Maritime Museum 275 (c. 12%), and for Graveyard of the Atlantic Museum 197 (c. 9% percent) (Figure 7.29).

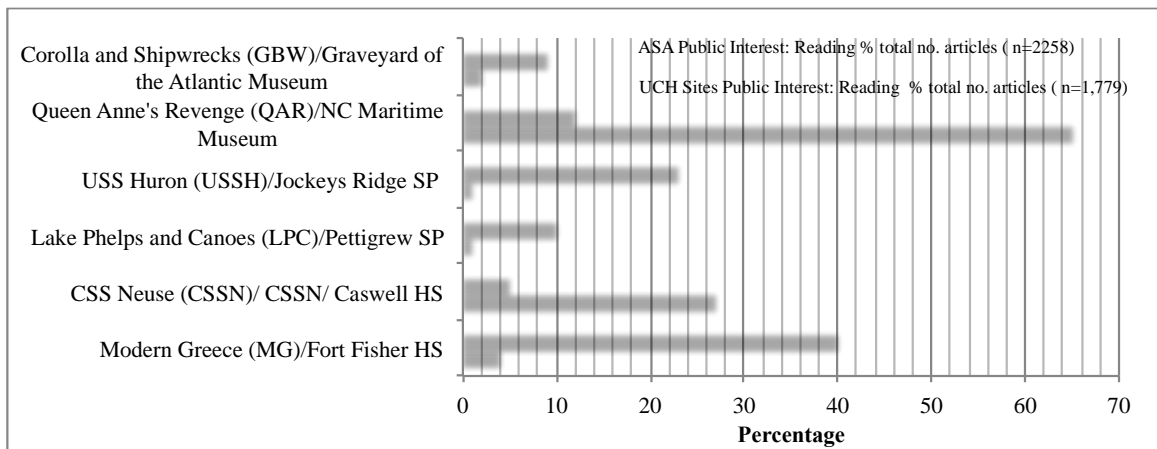


FIGURE 7.29. Percentages of total number of relevant articles for each of six UCH Sites and ASAs 1960/1961-2016/2017. (Figure by author, data source: ANHC (2018). (Per UCH site/ASA: lower bar= UCH site public interest; upper bar= ASA public interest)

To investigate how numbers of articles might equate with numbers of people as readers, a “Reading Public” (RP) number for each site was calculated as the product of the total number of articles in the three newspapers with most articles for each keyword search and the approximate daily circulation for those papers. For the six UCH sites, 1960/1961 to 2016/2017 the total RP was approximately 202 million (Table 7.9). Assuming for each newspaper, a circulation number equates with actual number of people reading it, comparing RP number with numbers of articles (Figure 7.30) shows the latter to give a good indication of the relative “Reading Public” for each site.

ANHC (2018) Keyword Search on:	Total No. articles 1960-2017	Total No. Publications	Total No. Articles in Top Three Publications (A)	Approx. Daily Circulation Top Three Publications (B)	"Reading Public" = A x B	% of Reading Public (RP) Total
"Modern Greece" and "Fort Fisher"	75	14	52	316,000	16,432,000	8%
"CSS Neuse"	476	37	364	163,000	59,332,000	29%
"Lake Phelps" and "canoe"	18	12	9	327,000	2,943,000	1%
"Huron" and "Nags Head"	23	8	13	334,000	4,342,000	2%
"Queen Anne's Revenge"	1,149	52	338	334,000	112,892,000	56%
"Corolla" and "shipwrecks"	38	14	18	334,000	6,012,000	3%
Totals	1779	137	794	1,808,000	201,953,000	100%

TABLE 7.9. Calculation of "Reading Public" (RP) number for total numbers of articles for keyword searches related to UCH Sites in ANHC database 1960/1961 to 2016/2017. "Reading Public" = total number of articles in top three publications for each keyword search (A) x approximate daily circulation of top three publications (B), totals for 1960/1961 to 2016/2017. (Table by author, data sources: ANHC (2018) database; daily circulations based on approximate circulations for 2010-2012 as in Appendix H).

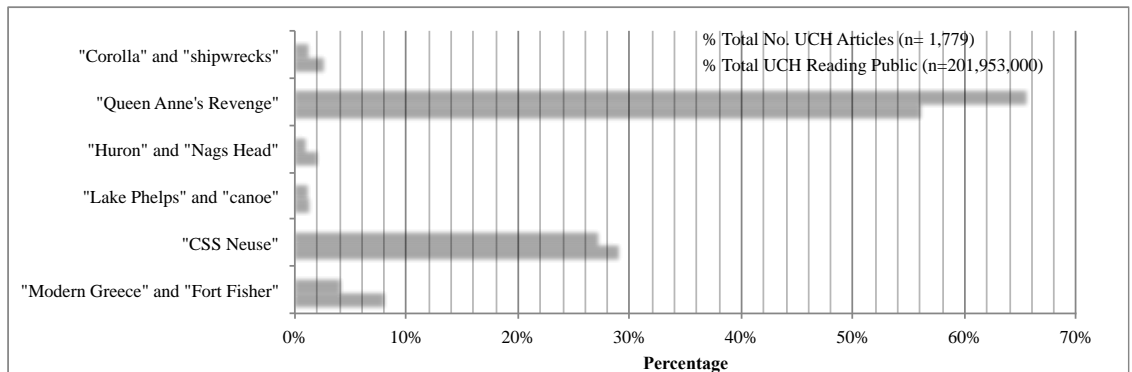


FIGURE 7.30. Comparing "Reading Public" (circulation) with Reading Public (total number of articles for six UCH sites 1960/1961 to 2016/2017). (Figure by author, data sources: ANHC (2018); Table 7.9. (Per UCH site/ASA: lower bar= % total UCH Reading public; upper bar = % per total no. UCH articles).

To compare levels of *reading public interest* in the six UCH sites and ASAs, the average number of articles per fiscal year for each was calculated. An open date range keyword search had found relevant newspaper articles for five of the sites even before their discovery, including back to the 19th century in the case of each of the identified vessels. Therefore, for calculating the average number of articles per year, it was assumed that there was potentially public interest in the identified vessel sites during all of the 57 years focused on for this investigation. As historic canoes were discovered in Lake Phelps in 1985, the average number of articles per year was over 32 years (Table 7.10). The average number of articles thus calculated per year were as follows: *Modern Greece* 1.3, *CSS Neuse* (or *Ram Neuse*) 8.5, *Lake Phelps Canoes* 0.6, *USS Huron* 0.4, *Queen Anne's Revenge* 20.1, and for "Corolla" and "shipwrecks" 0.6. By this measure (average number of articles per year) there was most *reading public* interest in *Queen Anne's Revenge* and least in *USS Huron*. Averages for ASAs were calculated for the number of

years each was under A&H responsibility since 1960. For the ASAs, there was most *reading public* interest in Fort Fisher Historic Site (16.0 articles per year) and least in CSS *Neuse* Historic Site (2.3 articles per year).

Players's Interest Indicators for period 1960/1961-2016/2017 (financial years)	Date Range: established or known	No. Years established	Public Reading	Public: Reading
UCH Sites	Date Range:	No. Years	Total No. Articles	Av. No. Articles
Modern Greece	1960-2016	57	75	1.3
CSS Neuse	1960-2016	57	476	8.5
Lake Phelps Canoes	1985-2016	32	18	0.6
USS Huron*	1960-2016	57	23	0.4
Queen Anne's Revenge	1960-2016	57	1,149	20.1
Corolla and Shipwrecks (George Brown Wreck)	1960-2016	57	38	0.6
Total			1,779	
ASAs	Date Range:	No. Years	Total No. Articles	Av. No. Articles
Fort Fisher Historic Site	1960-2016	57	909	16
CSS Neuse Historic Site	1964-2014	51	118	2.3
Pettigrew State Park	1960-2016	57	237	4.2
Jockey's Ridge State Park	1975-2016	42	522	12.4
NC Maritime Museum	1984-2016	33	275	8.3
Graveyard of the Atlantic Museum	2002-2016	15	197	13
Total			2,258	

TABLE 7.10. Reading public interest in six UCH sites and ASAs as indicated by average number of articles in North Carolina newspapers 1960-2016/2017. (Table by author, data source: ANHC (2018); Lawrence 2011). [Note: the search on “Corolla” and “shipwrecks” found 38 articles ranging in date between 1960 and 2016 – of these only some of the articles (2010-2016) related directly to the George Browne Wreck; * - USS *Huron* – search was for “Huron” and “Nags Head”].

Visiting Public Interest: Six UCH Sites and ASAs: 1960-2017 Period Totals

Data collected for *visiting public interest*, were visit numbers to ASAs. At the time of this study, USS *Huron*, an Underwater Shipwreck Preserve since 1991, was the only one of the six UCH sites accessible underwater to the visiting public. Lawrence (2003:69) reported its visitor numbers from information provided in Town of Nags Head annual reports to A&H, as approximately 300 per year. A&H Biennial Reports from 1960 to 2016 provided visitor numbers for ASAs with exhibits about four of the UCH sites: Fort Fisher Historic Site (from 1960 to

2016); CSS *Neuse*/Caswell Historic Site (from 1964 to 2014); NC Maritime Museum in Beaufort (from 1997 to 2016); and Graveyard of the Atlantic Museum from 2010 (Table 7.11).

ASAs came under A&H management responsibility at different times: Fort Fisher Historic Site in 1955; Fort Caswell/CSS *Neuse* Historic Site in 1964; NC Maritime Museum Beaufort in 1997; Graveyard of the Atlantic Museum in 2008; and Jockeys Ridge State Park, and Pettigrew State Park in 2015. Five of these ASAs provide the land *visiting public* with access to artifacts and exhibits relating to UCH sites. For this study their visit numbers were therefore assumed as also indicators for levels of *visiting public interest* in five of the UCH sites (actual or potential). Approximate total visitor numbers were for: Fort Fisher Historic Site 15.6 million (1960-2016); CSS *Neuse*/Caswell Historic Site 0.84 million (1964-2014); NC Maritime Museum 4.7 million (1997-2016); and Graveyard of the Atlantic Museum 0.48 million (2010-2016) (Table 7.11).

Players's Interest Indicators for period 1960/1961-2016/2017 (financial years)	Date Range under A&H management	No. Years under A&H management 1960-2016	Public: Visiting	Public Visiting
UCH Sites	Date Range	No. Years	Total No. Visitors	Av. No. Visitors
Modern Greece	1962-2016	55	0	0
CSS <i>Neuse</i>	1963- 2016	54	0	0
Lake Phelps Canoes	1985-2016	32	0	0
USS <i>Huron</i> *	1986-2016	31	N/A	300
Queen Anne's Revenge	1996-2016	21	0	0
Corolla and Shipwrecks (George Brown)	2007-2016	10	0	0
Total				
ASAs	Date Range	No. Years	Total No. Visitors (million)	Av. No. Visitors
Fort Fisher Historic Site	1955-2016	57	15.6	273,684
CSS <i>Neuse</i> Historic Site	1964-2016	51	0.84	16,470
Pettigrew State Park	1960-2016	57		142,728
Jockey's Ridge State Park	1975-2016	42		3,220,000
NC Maritime Museum	1997-2016	20	4.7	235,000
Graveyard of the Atlantic Museum	2002-2016	15	0.48	32,000
			22 million	

TABLE 7.11. Visiting public interest in six UCH sites and ASAs as indicated by average number of visitors for years under A&H management 1960-2016/2017. (Table by author, data source: NC A&H Biennial Reports; Lawrence 2011).

The NC PED (2012) report on all state attractions in North Carolina provided visit numbers for 2010-2011. These were assumed as the average number of visitors per year for Pettigrew State Park approximately 142,728, and for Jockey's Ridge State Park, the closest A&H managed land state attraction site to USS *Huron*, 3.22 million. For the two A&H historic sites there was greater *visiting public interest* in Fort Fisher (273,684 per year over 57 years) than in CSS *Neuse* historic Site (16,470 per year over 51 years). Of the two A&H museums there was greater *visiting public interest* per year in the NC Maritime Museum (235,000 per year over 20 years) than in Graveyard of the Atlantic Museum (32,000 per year over 15 years).

Summary

This chapter reported period totals for *public interest* indicator data collected for history and UCH in generally since the early 1960s in North Carolina, and in relation to the six case study UCH sites in particular. For *reading public interest*, keyword searches of all North Carolina news articles (n= 6.35 million) found *history* in approximately 8%. Zero articles were found for *underwater cultural heritage*, although for *archaeology* and *underwater* 475 articles were found. Approximately 0.06% of articles were found for *scuba*, of which approximately 18% were in combination with *fishing*, and less than 3% with *shipwreck* or *archaeology*. Almost none were in combination with *cultural heritage*. By keyword search for *history* themes, most articles found with *history* were: *public*, *Civil War*, *cost*, *education*, and *site*. Keyword search for *historic site* found 8,017 articles (approximately 0.1% of all NC articles). The combination of Fort Fisher and Civil War was found in 1,337 articles (0.02%). By OBX county, the greatest number of articles found with *history*, *museum*, *archaeology* and *cultural heritage* keywords were in combination with New Hanover County, and the least with Hyde and Tyrrell Counties.

For *visiting public interest*, in 2010-2011, there was most visits made to Jockeys Ridge State Park (over 1.6 million) and the fewest to CSS Neuse Historic Site (approximately 10,000). Of historic sites, there was most interest in two associated with the Civil War – Fort Fisher Historic Site, and Fort Macon. In OBX counties, most state attractions (NC DCR and NC DENR) were located in New Hanover and Dare Counties. New Hanover received approximately 35% of all visits to all attractions in OBX counties, and almost 50% of all visits made to NC DCR sites.

For the six UCH sites by comparison of average levels per year for interest indicator values *for public interest* there was most *reading public interest* in *Queen Anne's Revenge* and least interest in *USS Huron*. *USS Huron*, however, was the only underwater site accessible to the visiting public, receiving approximately 300 visitors per year (Lawrence 2003). Of the ASAs there was most *reading public interest* in the Fort Fisher Historic Site and least in the CSS *Neuse* Historic Site. For *visiting public interest* there was most in Jockeys Ridge State Park (3.2 million per year), and least in CSS *Neuse* Historic Site (16,470 per year).

CHAPTER 8

POLITICAL INTEREST IN HISTORY AND UCH IN NORTH CAROLINA

It shall be the policy of this State to conserve and protect its lands and waters for the benefit of all its citizenry, and to this end it shall be a proper function of the State of North Carolina and its political subdivisions to acquire and preserve park, recreational, and scenic areas, to control and limit the pollution of our air and water, to control excessive noise, and in every other appropriate way to preserve as a part of the common heritage of this State its forests, wetlands, estuaries, beaches, historical sites, open lands, and places of beauty.
(North Carolina Constitution, Article XIV, Section

Introduction

In North Carolina, there has been *political interest* in preserving and protecting the state's history and physical remains of its past since the early 20th century as evidenced by related state legislation and appropriations. This chapter describes results of the author's investigation of levels of *political interest* in North Carolina for history and UCH generally since the early 1960s, and in relation to the six case study UCH sites in particular. Indicators for levels of *political interest* were numbers of state legislative Acts and amounts of appropriations – both recurring (R\$) and non-recurring (NR \$). These indicators were chosen on the assumption that the greater the level of *political interest* the more legislation enacted and more funding appropriated for particular programs or projects. State government framework in North Carolina including federal and state legislation relating to history, remains of the past, UCH, and for A&H are reviewed first. Then, levels of state funding for A&H in general and for the six UCH case studies are described and compared. Period totals for indicator data collected are reported and described in this chapter. Changes over time are reported and analyzed in Chapter 10.

Data sources included: *North Carolina Session Laws*; *North Carolina State Budgets* and *North Governors Budgets*; *Archives and History Biennial Reports* (NC A&H 1960-2014), and the *North Carolina Program Evaluation Division's Report* for 2010-2011 (NC PED 2012). Data

collated by the author from these sources and from which analyses reported in this chapter are drawn are in Appendix D (legislation) and Appendix E (appropriations).

Government Framework for History and UCH in North Carolina

Under North Carolina's Constitution, State Government has three branches - the Legislative, Executive and Judicial (NC Constitution Articles II, III, and IV respectively). The *Legislative Branch* is a bicameral General Assembly of elected members: fifty in the Senate, and 120 in the House of Representatives. The work of the General Assembly is law making. If a bill passes both houses of the General Assembly it goes to the Governor, who can veto it or sign it into law. Once enacted, implementation of legislation is the responsibility of the *Executive Branch*.

The general structure of today's *Executive Branch* was established in 1971 by Executive Organization Acts (NC 1971a, b; Powell 1989:546-547). By which over 350 different state agencies were combined into 20 executive departments and agencies including A&H under the now named Department of Natural and Cultural Resources (NC 2015). Department heads are Governor's appointees. The Office of Administrative Hearings is a quasi-judicial agency adjudicating administrative laws. It publishes the NC Administrative Code, which sets out how public policy and legislated rules and regulations are to be administered and implemented in practice through the agencies. It also provides a route for the public to challenge applications of such rules by a particular agency.

The third branch of state government is the *Judicial Branch* which has three Divisions. The *Appellate Division* consists of the North Carolina *Supreme Court* and the *Court of Appeals*. Within the *Superior Court Division* are the general trial courts. *The District Court Division* has 41 district court districts, with 239 district court judges, elected to four-year terms. The

Administrative Office of the Courts is responsible for maintaining an effective and efficient court system.

A major task for the *Legislative* and *Executive* branches each legislative cycle is the State budget. Although confirmed annually, budgets are set biannually in the long sessions. The budget cycle begins with Departments (including agencies) submitting requested budgets to the Governor, hoping for inclusion in *The Governor's Recommended Budget*. This in turn is normally submitted to the Legislature in February and requests appropriations from the *General Fund* for all state operations that includes expenditures necessary to implement public policy for the state's natural and cultural resources. The bill for appropriations is initially submitted to the General Assembly, as the Governors' Budget, in March. The state's financial (fiscal) year runs from July 1 to June 30, but if the budget bill is not passed by end of June the General Assembly remains in session until it is.

Another layer of government in North Carolina are the 100 administrative counties, of which 41 are in the Coastal Plain region (Figure 8.1). Of these, 20 counties have an ocean or sound border and these are referred to in this study as "Outer Banks" or OBX counties. There are 21 "Inner Banks" (IBX) counties east of the fall zone with no ocean or sound border. Elected boards of commissioners in each county, some with the help of a professional county manager as chief executive, run each county. This includes setting rates, collecting taxes, and determining where funds are spent. State Government, however, decides the sources from which counties can raise income (Stick 2006:297-300).

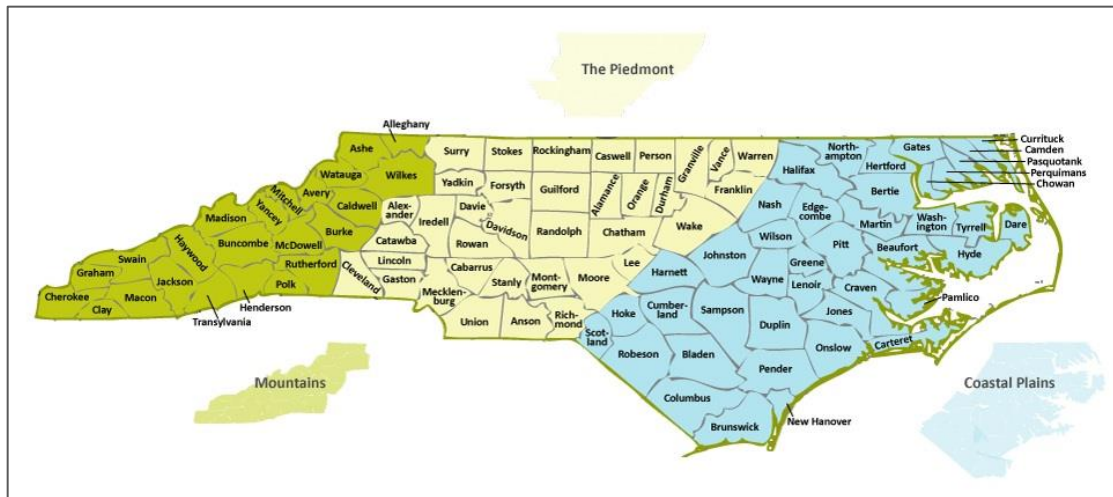


FIGURE 8.1 County Map of North Carolina. (Map source: <https://www.ncpedia.org/geography/counties>).

Political Interest: Legislative Framework in North Carolina for History and UCH

Since 1900, there have been at least 29 Federal and 41 State Laws (Appendix D) establishing public policies that affect North Carolina’s history, archives and physical remains of its past. Most legislation was enacted during the 1970s with at least 10 Federal and 11 State laws relating to natural and cultural coastal resources (Figure 8.2).

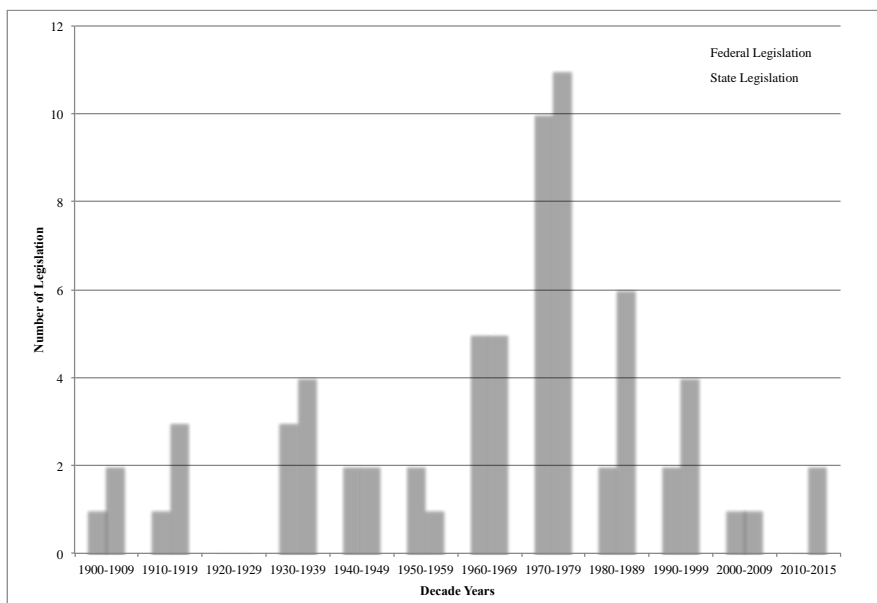


FIGURE 8.2. Numbers of federal and state legislations affecting archives and history in North Carolina per decade 1900-2015. (Figure by author, data sources: as in Appendix D). (per decade: left column=Federal; right column = NC state legislation).

Federal Legislation

The principal Federal laws that provide a framework for protection and regulation of coastal resources in North Carolina generally are the 1969 National Environmental Policy Act (NEPA) and the 1972 Coastal Zone Management Act (CZMA) (Beatley et al. 2002). The principal Federal laws affecting UCH are: long-standing Admiralty Law relating to Salvage and Finds Law; the 1953 Submerged Lands Act; the 1966 National Historic Preservation Act (NHPA); the 1972 Marine Protection, Research and Sanctuaries Act; the 1987 Abandoned Shipwreck Act (ASA); and the 2005 Sunken Military Craft Act. Federal legislation in relation to UCH, and shipwrecks in particular, has focused more on who has right of title, and therefore to access and use, rather than on protection. This is in contrast to archaeological resources on land for which Federal legislation has aimed more at protection, beginning with the 1906 Antiquities Act (Runyan 2011; Varmer 2014).

Admiralty Law: Salvage and Finds

Shipwrecks and their cargoes are subject to *Salvage* and *Finds law* as a sub-category of *Admiralty Law*. *Salvage Law* applies when a vessel has a known owner and is in 'marine peril' or in danger of being lost at sea. The first salvor to find a wreck can lay claim to it through an 'arrest' submitted through marine courts. The salvor can then recover the wreck and or cargo and receive a reward equal to the value of the property recovered. The original owner still has ownership interest. *Finds Law*, as the common law of finds was developed in relation to property on land deemed abandoned by its owner. It is usually applied to resources not covered by private property law, such as fish or beached whales, but may also apply to abandoned historic shipwrecks with no identifiable owner - unless embedded in submerged lands, or if the owner of the submerged land has *constructive possession* in which case the owner of the submerged land

also owns the shipwreck. If, however, an original owner can prove the wreck was never abandoned this law doesn't apply (Varmer 2014: 5-11).

North Carolina has a long history of shipwrecks given the nature of its coastline. From the 17th century into the early 1900s, salvaging or 'wreck busting' and auction sale (*vendue*) of cargoes from beach wrecks could be extremely profitable and was a large cash industry on the coast. The first to record the wreck could claim possession but the state government appointed wreck commissioners in an attempt to prevent outright plunder (Stick 1952:3-5). Paid salvagers could still reclaim the cargo for the owners and/or their insurers.

Until the 1960s, recovery of wrecked commercial ships and cargoes was primarily the concern of owners, insurance companies and salvors. With development of diving technology in the 1960s, however, interests of some salvors expanded to include commercial salvage of historic wrecks. At the same time others came to recognize the historic and archaeological value of such sites. Thus, began the legal and ethical struggle between groups with different interests in shipwreck sites, now considered Underwater Cultural Heritage (UCH). Those wanting to protect UCH from treasure hunting salvors have sought to do this through salvage law, through legislation in place to protect other coastal resources or archaeological materials on land and through new laws, all with varying success (Boesten 2002:100-101; Varmer 2014).

Submerged Lands Act, 1953

In 1953, the *Submerged Lands Act* transferred title of submerged lands underlying navigable waters up to three miles offshore to coastal states, including to the natural resources. Enabled by this Act a number of states (including North Carolina) in the 1960s and 1970s enacted historic management and preservation laws related submerged resources including shipwrecks (Shaw 2001). Some salvors and treasure hunters, however, continued to lay claim to

the same wrecks under Admiralty Law thus challenging state's laws aimed at protecting the archaeological resource. The status of non-natural, non-renewable resources - including shipwrecks and other cultural resources - remained unclear.

National Historic Preservation Act (NHPA), 1966

The 1966 *National Historic Preservation Act* (NHPA) administered by the National Park Service (NPS) established a National Register of Historic Places (NRHP), for which historic shipwrecks are eligible if they meet significance criteria as defined in National Register Regulations: 36CFR 60.4. Furthermore, under Section 106 of the Act, public agencies are required to consider effects of federally funded projects on cultural resources, in order to: identify (Phase I), investigate (Phase II), and mitigate (Phase III) sites as appropriate. State Historic Preservation Officers (SHPOs) manage compliance and make recommendations for listing to the National Register to the NPS (King 2004:81-190). By 2009, nationwide there were over 80,000 sites on the NRHP of which 102 were shipwrecks or shipwreck districts containing multiple sites (NPS 2009).

Marine Protection, Research and Sanctuaries Act, 1972

The 1972 *Marine Protection, Research and Sanctuaries Act* authorized the US Secretary of Commerce to designate areas of marine environment for protection of natural and cultural resources. Protection measures can include: prohibited activities, permit systems, site monitoring, enforcement, in situ conservation efforts, education and outreach, ongoing research, selective recovery, and conservation & analysis of recovered artifacts. The first marine sanctuary, established under the Act, was the wreck site of USS *Monitor* in 1975. The purpose of this marine sanctuary includes "To preserve the historical context and shipwreck remains of our nation's most famous ironclad" (NOAA 2008:7). Although located in Federal waters, 16 miles

SSE of Cape Hatteras off the North Carolina coast, North Carolina's A&H underwater archaeologists were involved in discovery and investigations at the site during the 1970s (Broadwater 2012; Watts1985). Nationally, there are now fourteen National Marine Sanctuaries encompassing 150,000 square miles. They are administered by the National Oceanic and Atmospheric Administration (NOAA) a federal agency in partnership with State and other local bodies.

Abandoned Shipwreck Act, 1987

The 1987 *Abandoned Shipwreck Act* (ASA) aimed to clarify who had title to which wrecks. One of the sponsors of the Bill was North Carolina Senator Walter B. Jones Senior. Under the ASA, Federal Government claims title to all abandoned shipwrecks, whether on State or Federal submerged land, apart from those on Indian lands (Section 6). Title to three categories of abandoned shipwrecks was transferred, however, to individual States (Section 6a and 6c): those embedded in a State's submerged land; those embedded in coralline formations if protected by a State on its submerged land; and any wreck on a State's submerged land that is on, or eligible for, the National Register of Historic Places. Title to abandoned wrecks on or in Federal (public) land remains with the US Government, and to those on Indian lands with the tribe owning the land (Section 6d).

Implementation of the ASA at Federal level falls to the Secretary of the Interior acting through the Director of the National Park Service (NPS). At the State level, implementation is through their State Historic Preservation Officer (SHPO) as established under the 1966 National Historic Preservation Act (NHPA). The NPS produced guidelines for public agencies (Federal and State) to develop legislation and regulations to implement this public policy. Interest groups were to be included in future management of this marine resource. Such interest groups might be

divers, sport shops, commercial and recreational fishers, marina operators, historians, maritime conservators, museums, archaeologists, marine biologists and commercial salvors (NPS 2007).

Despite the 1987 ASA, however, claims to title over shipwrecks still find their way to the courts and a number of rulings since have undermined States' title as intended under the Act, for example, rulings in the cases of: *Lady Elgin* (Wisconsin Underwater Archaeological Association 1991); *Brother Jonathan* (Gould 2011:343-345); and *Juno* and *La Galga* (Bondareff 2000). A major problem being that the ASA does not clearly define 'abandoned' nor adequately account for claims by other nation states to their ships, even if wrecked hundreds of years ago, in US waters. As passed, the ASA is estimated to only give protection to about 5% of historic shipwrecks known in state waters. It gives no protection for wrecks beyond state waters, sovereign vessels, nor for other sites relating to maritime cultural heritage (McManamon 2002; Workman 2008; Varmer 2014).

Sunken Military Craft Act, 2005

Until the 2005 *Sunken Military Craft Act* there was no policy or legislation for protecting UCH beyond state waters, apart from those in marine sanctuaries. In 2001, President Clinton, seeking to clarify policy at least for sunken government vessels, aircraft and spacecraft, issued a statement that "...disturbance or recovery of such craft should not occur without the express permission of the sovereign..." (Hayes 2004). The *Sunken Military Craft Act* goes some way to improve protection of sunken military vessels, including as grave sites, even historic ones (Bederman 2006:649-663; Varmer 2014:42-45). Regulations for permitting of activities at historic sunken military craft under the Act, including archaeological investigations are as issued in Federal guideline 32 CFR 767.6 *Historic Sunken Military Craft and Terrestrial Military Craft Permit Application*.

North Carolina State Legislation

North Carolina's General Assembly first enacted legislation to preserve and protect its archives and history in March 1903 (NC 1903; Wegner 2003). In March 1903, the *North Carolina Historical Commission* (NC HC) was established as the public agency to implement this public law and policy (Powell 1989:448-449; Wegner 2003; NC HC 1904). In 1907, the 1903 Act was amended to increase duties and powers of the agency (NC 1907; NC HC 1907:4-6).

By the 1907 Act, the NC HC was to collect historical data about the history of North Carolina and territory from earliest times, and then edit and publish it through the State Printer. Records collected could come from old newspapers, county, court and church records, and private collections. It was also to properly mark and preserve battlefields, houses and other places celebrated in the history of the State. It was to diffuse knowledge about the history and resources of North Carolina, including through encouraging study of North Carolina's history in State schools. Finally, it was to stimulate and encourage historical investigation and research among peoples of the State. The NC HC was to submit Biennial Reports to the General Assembly, to include accounts of its activities, budgets, expenditures, revenues and future needs, which it has done since 1907 (NC HC 1907:4-6).

Since 1907, further successive legislations have variously expanded the agency's size, scope, and activities, and changed its name and position within the Executive branch of State Government. Federal and state legislations have determined not only the duties, powers, organization and structure of the state's public agency tasked with implementing such legislation and public policy, but also its culture and activities. State legislation, enacted by the end of the 1930s, continues today to define the agency's core mission, responsibilities and activities,

particularly in relation to public records, museums, historical sites and archaeology. By the end of the 20th century, remains of the past within the agency's management responsibility included: state archives and records; museums; and historic and archaeological sites on land and underwater.

NC Public Records Act, 1935

The 1935 *Public Records Act* (NC 1935a) defined public records and assigned accountability for their preservation and protection to the NC HC. Sale, loan or destruction of public records was prohibited without the agency's permission. The public was to be provided access to public records that were also to include staff's own work-related papers (Wegner 2003:19). Legislation in 1945 required the agency to implement measures to prevent unauthorized destruction of public records and to ensure no permanently valuable records were accidentally disposed of. By the end of the 1940s, the Department was responsible for managing records of the present-day administration and agencies, as well as the state's historical records (Wegner 2003:33). During the 1950s the agency's records management activities expanded to include identification and microfilming of North Carolina newspapers (Wegner 2003:39-40). By 1959, a comprehensive program for local records was underway including collecting county records, microfilming, inventorying and restoring documents (Wegner 2003:52-53).

In 2015, an amendment sought to confirm and clarify that public records included in relation to the state's UCH:

All photographs, video recordings, or other documentary materials of a derelict vessel or shipwreck or its contents, relics, artifacts, or historic materials in the custody of any agency of North Carolina government or its subdivisions shall be a public record pursuant to G.S.132-1. There shall be no limitation on the use of or no requirement to alter any such photograph, video recordings, or other documentary material, and any such provision in any agreement, permit, or license shall be void and unenforceable as a matter of public policy. (NC General Statute 121-25(b); NC Session Law SL2015-218 (House Bill 184)).

Highway Historical Marker (NC HHM) Program, 1935

In 1935 the NC HC also took on responsibility for implementation of North Carolina's *Highway Historical Marker (NC HHM) Program* (NC 1935b; Wegner 2003:19). This program was consistent with the agency's duties to not only recognize and preserve memory of historical sites but also to educate the public about history, whilst contributing to the state's economy. The General Assembly initially appropriated \$5,000 per year for three years for the program. The program aims to standardize the marking of sites that are of statewide historical significance, commemorating people and events (NC HHM 2011). The public can submit suggestions but the legislation also established an advisory committee of professionals and academics, whose approval was required before markers were erected (Wegner 2003:19). By 2010, over 1500 markers were in place across the state (NC HHM 2011).

North Carolina Archaeology Legislation, 1930-1940s

Through the 1930s and 1940s, archaeology in North Carolina became increasingly established as an academic and professional discipline and attracted greater public and political interest. The *Archaeological Society of North Carolina* was formed in 1933. Through its efforts the *Indian Antiquities Law* (NC 1935c), enacted in 1935, was the state's first legislative recognition of the scientific and historic value of its prehistoric material remains. Under this regulatory legislation, destroying or selling artifacts found on state property was a misdemeanor. The public was also encouraged to hand over any Indian artifacts they found to the Historical Commission.

In 1939, the *North Carolina Society for the Preservation of Antiquities* was formed as a private organization that would be influential in future preservation initiatives. Christopher

Crittenden, Head of A&H, was an ex officio member and the society had office space within the NC HC headquarters in Raleigh (Wegner 2003:24).

During the 1930s and early 1940s, despite the economic depression and a World War, the NCHC was able to initiate and progress a number of major archaeological and historic site projects through partnerships with other groups and organizations. These included the *North Carolina Archaeological Society*, *University of North Carolina* and the *Federal Works Progress Administration's* (WPA). As a federal initiative the WPA's budget was much larger than the Commissions. One of these joint archaeological projects, with excavations starting in 1939, was at Town Creek Indian Mound in Montgomery County (Wegner 2003:20-23).

North Carolina Archives and History Act, 1945

In 1945, by *The North Carolina Archives and History Act* (NC 1945) the NC HC became the *State Department of Archives and History* (A&H). This Act expanded, redefined and clarified the agency's duties, functions and organization (Wegner 2003:34-42). The former commission became an advisory *Executive Board of Archives and History*. Within the Department several divisions were created including the "Hall of History" which became the Division of Museums in 1950 (Johnston 1979:10-11).

North Carolina A&H and State Historic Sites Legislation, 1955

In 1955, following recommendations of the *Commission for Reorganization of State Government*, the General Assembly added responsibility for management and preservation of the state's historic sites to A&H. Legislation in 1955 also enabled A&H to work with and advise other state, local agencies and organizations in historic preservation projects. A Division of Historic Sites within A&H was established, which as reported in the NC A&H Biennial Report for 1954-1956:

... opened the way for promoting historic preservation in the State at large, as an important means of preserving North Carolina history, and for doing much to keep all such work done in the State up to acceptable standards of excellence. (NC A&H 1956:22).

In the A&H Biennial Report for 1958-1960 the purpose and mission of the Historic Sites Program was stated:

...The chief and fundamental purpose of the Historic Sites Program is to preserve and develop for public use sites and structural properties that are significant in the history of our State. It is a practical program of conservation and development. The difference between this type of conservation and that involving forestry and wildlife is largely one of subject... (NC A&H 1960:37-39)

Also, in 1955, the General Assembly set up the Caswell Memorial Commission. With an appropriation of \$25,000 it was to purchase, restore and develop the site in Kinston presumed to be the location of Governor Richard Caswell's burial. The plot and surrounding acres were donated to the state in 1956 (Wegner 2003:35). This historic site was for over 50 years also the resting place of the Civil War ironclad CSS *Neuse* following its recovery from the river Neuse in 1962-63. During the second half of the 1950s the Historic Sites Division undertook archaeological investigations at historic sites as part of the work to investigate, preserve and present them to the public. These activities included excavations at Fort Fisher Historic Site (NC A&H 1960:40).

North Carolina Confederate Centennial Commission, 1959

In 1959, the General Assembly, established two Commissions in preparation for two upcoming anniversaries – the Carolina Charter Tercentenary in 1963, and the one-hundredth anniversary of the Civil War (1961-1965). The *North Carolina Confederate Centennial Commission* (NC CCC) was to represent North Carolina in nationwide events and to research, publish, and increase tourism to Civil War sites in North Carolina. It was established as a nonprofit corporation to raise funds. It set up county subcommittees and planned events. With

some funds from the General Assembly the NC CCC worked with A&H on many initiatives. These included developing historic sites, new highway historical markers, publication of NC roster of soldiers in the Civil War, extending educational outreach with a “Mobile Museum of History”, and salvage at underwater sites (NC 1961; Wegner 2003:47).

North Carolina UCH Legislation, 1963

The first state legislation and public policy relating specifically to underwater archaeological sites was in 1963 (NC 1963a, b) when the General Assembly, with the NC CCC, provided funding to establish a preservation laboratory at Fort Fisher to treat artifacts from *Modern Greece* and other Civil War wrecks.

North Carolina UCH Legislation, 1967

State legislation to protect and preserve underwater sites and shipwrecks was enacted in 1967 (NC 1967). The bill, sponsored by Representatives from New Hanover County was prompted by the salvage company Flying W Enterprises taking artifacts from *Modern Greece* and other Civil War shipwrecks (Albertson 1965a, 1965b; Lawrence 2011; *Wilmington Morning Star* 1965, 1967, 1968). Under Chapter 533 of North Carolina Session Laws, and subject to Chapter 82 of General Statute entitled “Wrecks” and to Chapter 210 of 1963 Session Laws, Section 3 of the 1967 Act authorized A&H to employ professional staff to conduct and/or supervise “...surveillance, protection, preservation, survey and systematic archaeological recovery of underwater materials” as defined in Section 1. The Act came into effect on July 1, 1967. It was not until 1971, however, before there was a budget appropriation for employment of professional underwater archaeologists (Watts and Bright 1973; Lawrence 2011).

North Carolina Executive Organization Act, 1971

As part of the reorganization and rationalization of state government under the 1971 Executive Organization Act, a new *Department of Art, Culture and History* (ACH) was created (NC 1971a, b). This incorporated into one agency the State Library, Museum of Art and over thirty other historical and cultural groups. Archives and History was not formally incorporated into the new department until 1972-1973. The delay was partly due to the Historic Commission board's concern to ensure that political intrusion would not encroach on its professional and scholarly standing and independence (Johnston 1979:12-13; Wegner 2003; NC A&H 1974).

North Carolina Archives and History Act, Amendment, 1973

In 1973, further amendment to the NC Archives and History Act (NC 1973b) renamed and established A&H as the *Department of Cultural Resources* (DCR). The Act defined its scope, roles, powers, duties and responsibilities, including incorporating the Office of Archives and History, which became the *Division of Archives and History* (A&H) within DCR. A&H continued to be responsible for collecting, preserving and administering the State Archives as public records, administering the Highway Historical Marker and Archaeology programs, and administering the National Register of Historic Places. DCR eventually came to include the NC Museum of History (originally the Hall of History museum) in Raleigh, maritime museums in Beaufort, Southport and Hatteras, four regional museums including Museum of the Albemarle in Elizabeth City, North Carolina Museum of Art, the North Carolina Symphony, historic sites, and the Historic Preservation Foundation of North Carolina (Wegner 2003:57).

A&H had employed archaeologists and participated in archaeological projects since 1930s but archaeology was not administered as a separate section within A&H until 1973. In September 1973 an *Archaeology Section*, within the *Division of Archives and History*, was

created and most archaeological work was removed to it from the Historic Sites and Museum Section. From 1977 to 2001, however, Archaeology was combined administratively with Historic Preservation (HP).

In 2001, internal restructuring and reorganization of the Department included bringing all archaeological operations in DCR under an *Office of State Archaeology (OSA)*. A&H became the *Office of Archives and History*, with three divisions: State History Museums, State Historic Sites, and Historical Resources. The OSA was placed within the Division of Historical Resources. The reorganization instigated by DCR's new Secretary, Lisbeth C. Evans, was intended to "promote greater efficiency, to foster better communication across sectional boundaries and to create centers of excellence for programs with shared missions" (Wegner 2003:100).

Evaluation of North Carolina's State Attractions, 2010-2011

In 2010-2011, the General Assembly instructed the NC Program Evaluation Division (NC PED) to review and report on management of all state attractions, at that time administered by two state agencies – the Department of Cultural Resources (DCR) and the Department of Natural Resources (DENR). The goal of the review was to investigate: how these various state attractions were administered in comparison to other states; their operational characteristics; and to recommend more efficient and effective ways to operate and administer them in future. The review was also to consider the cost benefits of bringing all the state attractions under one agency instead of two. The report did not find that consolidating attractions under one agency (DCR or DENR) would result in cost saving nor enhance the effective management of state attractions (NC PED 2012:1).

North Carolina Archives and History Act, Amendment, 2015

In 2015 the General Assembly enacted legislation, including amendments to the NC Archives and History Act, to bring all state attractions under one agency. DCR was re-established as the *Department of Natural and Cultural Resources* (NC 2015). “Natural Resources” moved from DENR were the state parks, aquaria, zoo, and Museum of Natural History. DENR was renamed the NC Department of Environmental Quality. The Division of Coastal Management remained part of NC DEQ. “Cultural Resources” include the State’s library and archives, the Art Museum, the NC Symphony Orchestra, history and maritime museums, historic sites, and archaeological resources from land and underwater sites. Within this new Department of Natural and Cultural Resources (NCR), Archives and History (A&H) remained an Office (NC 2015).

The new *Department of Natural and Cultural Resources* vision was to be the leader in using the state's natural and cultural resources to build the social, cultural, educational and economic future of North Carolina. Its mission was:

...to improve the quality of life in our state by creating opportunities to experience excellence in the arts, history, libraries and nature in North Carolina by stimulating learning, inspiring creativity, preserving the state's history, conserving the state's natural heritage, encouraging recreation and cultural tourism, and promoting economic development. (NC NCR 2016).

Also, NCR:

...Celebrates North Carolina history from pre-colonial times to the present, safeguards documentary and material evidence of earlier generations, and provides leadership and assistance to government agencies, individuals, businesses and organizations to further the stewardship of the state's historic resources”. (NC NCR 2016)

Within the A&H’s Division of Historical Resources, *the Office of State Archaeology* (OSA) was to: coordinate and implement a statewide program of prehistoric, historic and underwater archaeology; survey statewide archaeological resources; and issues permits to

individuals and groups for operations and salvage of land and sea properties in North Carolina (NC NCR 2016).

Political Interest: Funding for North Carolina's Public Agency for Archives and History

North Carolina's public agency for A&H, as originally established in 1903 as the *North Carolina Historical Commission* (NC HC), was one of the first in the USA to have appropriated public funds for identifying, collecting and preserving historic records and objects (Wegner 2003). Since then enabling legislation has included recurring (R\$) and non-recurring (NR\$) appropriations for A&H from the General Fund (GF) within the State's Budget to enable the agency to implement policy, rules and regulations as required by law.

Assuming levels of state appropriations are indicators of levels of *political interest*, the author investigated appropriations to A&H generally, and to various state attractions and UCH projects. Data sources for appropriations included NC State Budgets (1949-2014) and NC A&H Biennial Reports (1950-2015). Data as collected are reported in tables in Appendix E and Appendix F.

Recurring Appropriations

Annual recurring appropriations (R\$) for A&H from the General Fund (GF) generally cover permanent staff and basic facilities costs at A&H's different historic sites, museums, outstations, and headquarters in Raleigh.

Appropriations (R\$) to A&H: 1950-2014: Period Totals

North Carolina's total General Fund (GF) budget, from 1950-2014, was almost \$430 billion. Over this 65-year period, A&H's total appropriation from the GF was approximately \$680 million (0.16% of GF total). In 1950/1951, A&H's total appropriation was \$93,723 (0.06% of GF). In 2013-2014 it was approximately \$26.84 million (0.13% of GF). Its highest percentage

of GF, at 0.24%, was in 1984/1985 and 1986/1987. Since then there has been an overall downward trend in A&H annual appropriations as a percentage of GF (Figure 8.3, 8.4).

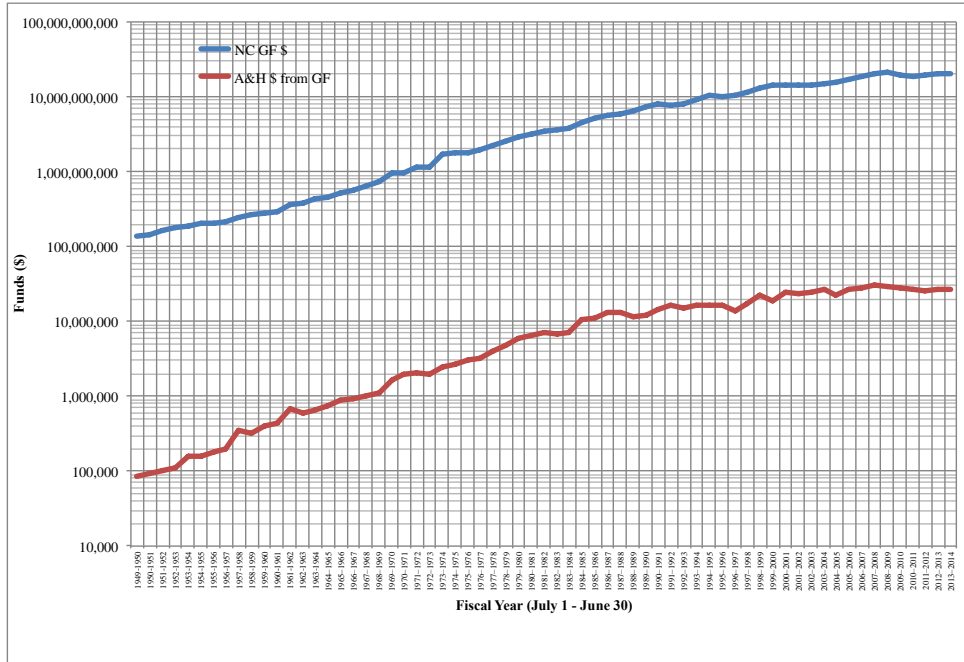


FIGURE 8.3. North Carolina state budget annual General Fund (NC GF) (\$) and Archives and History (A&H) appropriations from GF (\$) 1949/1950 to 2013/2014. Funds are on a log scale. (Figure by author, data sources: North Carolina State Budgets (1949-2014); A&H Biennial Reports (NC A&H 1950-2014).

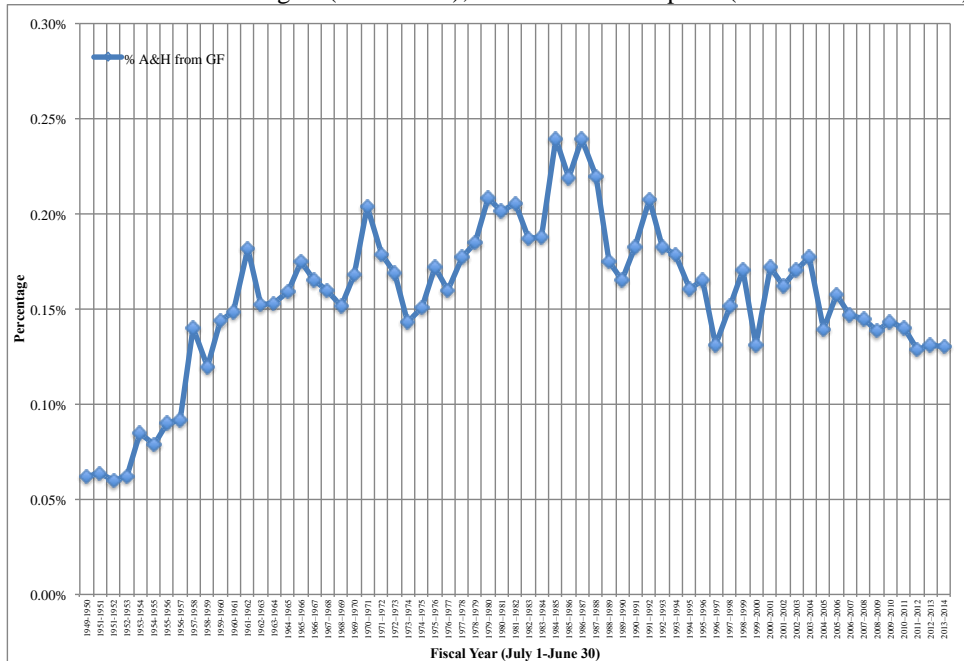


FIGURE 8.4. A&H annual appropriations as percentage of North Carolina General Fund, 1949/1950 to 2013/2014. (Figure by author, data sources: North Carolina State Budgets (1949-2014); A&H Biennial Reports (NC A&H 1950-2014).

Appropriations (R\$) to Divisions within A&H: 1960-2014: Period Totals

Since 1959-1960, various A&H divisions have been responsible for preserving and protecting historical physical remains of the past, including UCH – for historic sites, museums, and archaeology. To investigate relative levels of political interest in each of these areas, their shares of recurring annual state appropriations (R\$) to A&H were calculated from appropriations data collected by the author. From 1959 to 2014, A&H received in total almost \$678 million in R\$, approximately 0.16% of the total NC General Fund (GF) over this time. Of this historic sites (HS) received in total over \$221 million (approximately 33%). As a distinct section within A&H, Archaeology over a total of 19 years received approximately \$12 million (Figure 8.5).

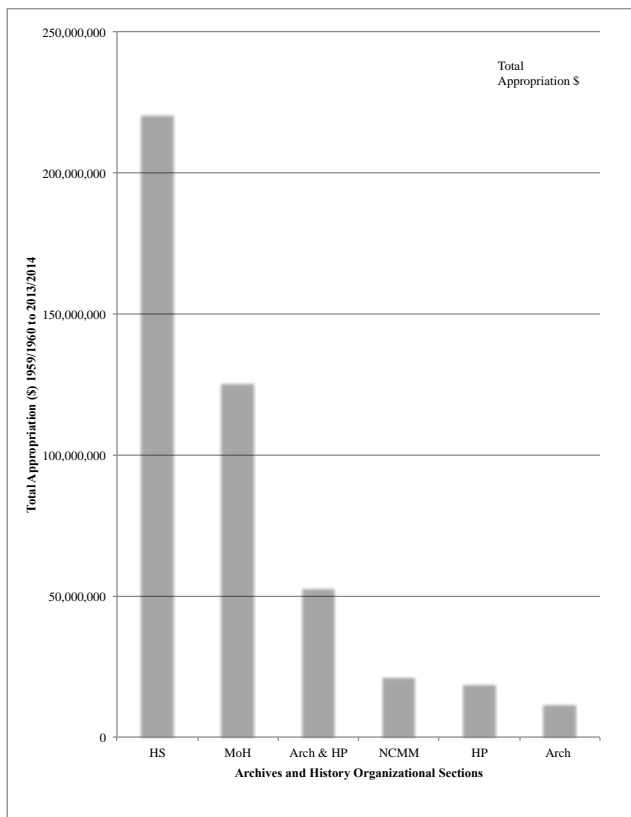


FIGURE 8.5. Total appropriations (\$) for A&H Sections 1959/1960 to 2013/2014.

(Figure by author, data sources: A&H Biennial Reports (NC A&H 1960-2014).

Key: A&H (Archives and History); HS (Historic Sites); MoH (Museum of History); Arch (Archaeology); HP (Historic Preservation); NCMM (NC Maritime Museum Beaufort).

Appropriations (R\$) to A&H State Attractions: 2010-2011

The *North Carolina Program Evaluation Division's* report (NC PED 2012) on state run attractions in 2010-2011 included expenditure and revenue for each site. From data in this report the author calculated each site's approximate state R\$ appropriation for 2010-2011- from total expenditure less revenue as reported for each site. This data was used to compare levels of *political interest* (as indicated by amounts of R\$ appropriations) in various state attractions for this one fiscal year by: type of site (*museum, historic site, commission*); Coastal Plain region (IBX and OBX counties); and theme of site (*cultural, regional history, place-person, maritime, economy, military, settlement*).

APPROPRIATIONS (R\$) BY TYPE OF SITE: 2010-2011

In 2010-2011, 33 A&H state attractions (22 historic sites, 7 museums and 4 commissions), received in total almost \$19.62 million (Table 8.1). This was approximately 68% of DCR's overall appropriation (\$28.8 million) for that year. Approximately \$6.27 million (22% of DCR's total funding) was allocated to four commissions - Tryon Palace, Roanoke Festival Island, USS North Carolina, and NC Transportation Museum. Seven A&H managed museums received approximately \$8.26 million (29%), and 22 historic sites in total received approximately \$5.08 million (15%).

Some revenue earned was reported by all but four sites statewide (Mountain Gateway, Museum of Cape Fear, Graveyard of the Atlantic and Maritime Museum in Southport). USS *North Carolina*, earned the most in revenue, almost as much as it reported in expenditure, which was approximately \$3.09 million, bringing its net cost to the state as reported by NC PED (2012) just \$0.32 million. Eight sites reported minimal revenue of less than \$500. On average per site, commissions received approximately \$1.56 million (5%) of DCR's appropriation, historic sites

approximately \$0.23 million (1%), and museums approximately \$1.18 million per site (4%). The Museum of Art (not managed within A&H) received approximately 25% of DCR’s total annual appropriation in 2010-2011 (Table 8.1).

DCR A&H sites 2010-2011	No. of Sites	Total Expenditures \$	Revenue \$	Net Expenditure \$/Appropriation	Appropriation as % of Total DCR App \$
Commissions (C)	4	10,849,500	4,579,160	6,270,340	22%
Historic Sites (HS)	22	5,256,353	176,834	5,079,519	15%
Museums (Mu)	7	8,290,504	21,557	8,268,947	29%
Total A&H Sites	33	24,396,357	4,777,551	19,618,806	68%
NC Museum of Art (non A&H)	1	7,481,195	333,809	7,147,386	25%
Other DCR costs				2,033,808	7%
TOTAL DCR	34	34,000,000	5,200,000	28,800,000	100%
Average \$ per C site	1	2,712,375	1,144,790	1,567,585	5%
Average \$ per HS site	1	238,925	8,038	230,887	1%
Average \$ per Mu site	1	1,184,358	3,080	1,181,278	4%
Average \$ per site all A&H sites	1	739,284	144,774	594,509	2%
Average \$ per site Museum of Art	1	7,481,195	333,809	7,147,386	25%

TABLE 8.1. Appropriations for A&H state attractions by type of site as a share of the total DCR appropriation from General Fund (GF) 2010/2011. (Table by author, data source: NCPED (2012)). Key: C= Commissions; HS = Historic Sites; M = Museums. Note: Museum of Art is separate within DCR, it is not managed by A&H but included in table for comparison.

APPROPRIATIONS (R\$) BY SITE THEME: 2010-2011

As reported by NC PED (2012), of 34 state attractions managed by DCR in 2010-2011, 33 were within A&H and one, the Museum of Art, was administered separately. To investigate if the amount of appropriation received varied with site theme the author categorized the 34 attractions as either: *cultural* (C), *regional history* (RH), *place-person* (PP), *maritime* (Ma), *economy* (Ec), *military* (Mi), or *settlement* (S). Calculations made from NC PED (2012) data included: number of sites in each theme group as a percentage of all DCR sites, the share of DCR’s total appropriation (\$28.8 million) received by each group (Figure 8.6 and 8.7), and the average appropriation received per site within each theme group (Appendix C).

There was one *cultural* site - Museum of Art – and this received almost 25% (\$7.14 million) of the total DCR appropriation R\$ of \$28.8 million. Sites by theme with the smallest percentage share of DCR’s appropriation were those with a *military* or *settlement* theme at just 5% (\$1.47 million) in total each, even though the *military* group had the most sites (eight). Seven

of which were historic sites (including Fort Fisher and CSS *Neuse*/Richard Caswell Site). The *regional history* group (four museums) received the second highest share of DCR appropriation with 23% (\$6.6 million). The *maritime* theme group received in total 12% (\$3.75 million) of DCR's appropriation. This group included A&H's three maritime museums in Beaufort, Southport, and Hatteras (Graveyard of the Atlantic museum) and a commission (Roanoke Festival Island Park). Of the *maritime* group's appropriation 55% went to Roanoke Festival Park.

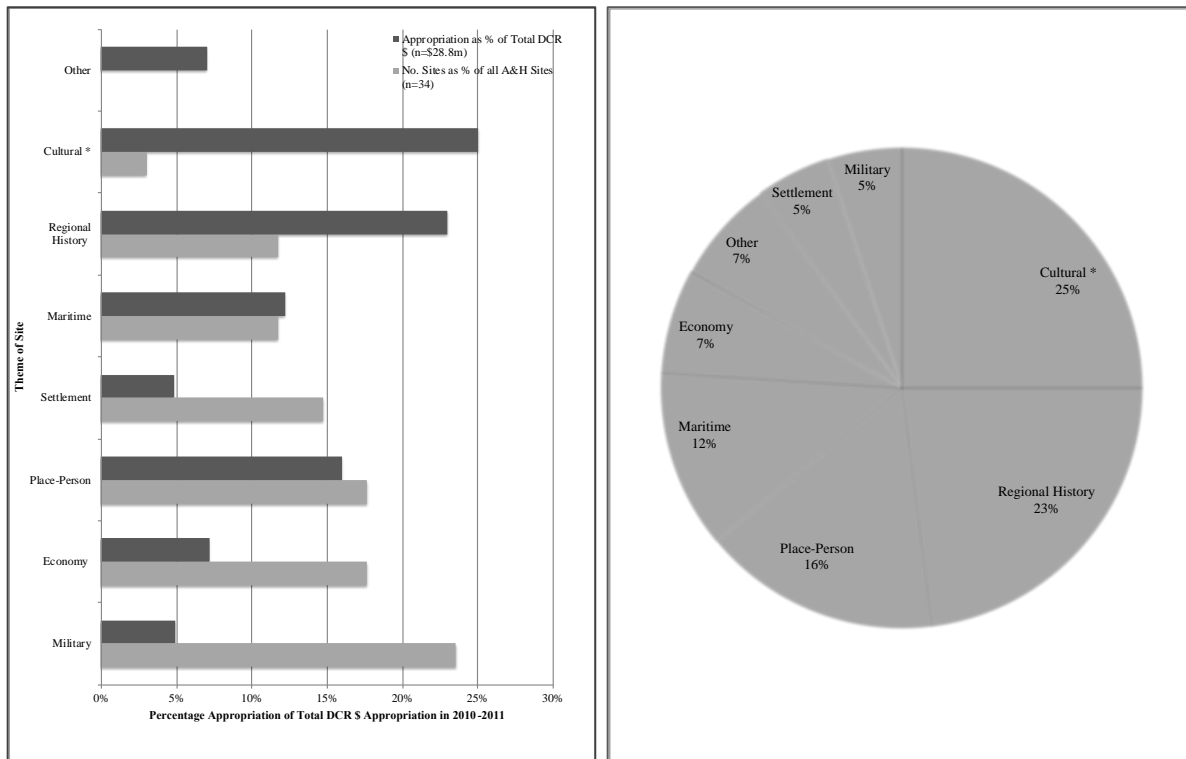


FIGURE 8.6 (left). Number of sites by theme as percentage of total number DCR sites (n=34) [33 A&H and one Cultural* Site (Museum of Art)]. Other = other central DCR/A&H costs. Appropriations for sites by theme as percentage of DCR appropriation in 2010-2011 (n=\$28.8m). (Figure by author, data source: NC PED (2012)). FIGURE 8.7 (right). Appropriations for all DCR sites by theme, as percentage of total DCR appropriation in 2010-2011 (n=\$28.8m). (Figure by author, data source: NC PED 2012).

The average appropriation per site for DCR sites by theme as percentage of total DCR average appropriation per site in 2010-2011 (n=\$13,282,743) were: *regional history* (12%), *maritime* (7%), *people-place* (6%), *economy* (3%), *settlement* (2%), and *military* (1%). The highest average appropriation per site by was the *cultural* site - Museum of Art - with 54% of total DCR average appropriation. *Maritime* themed sites received an average of about \$0.88

million per site, and *military* themed sites an average of about \$0.17 million per site in 2010/2011 (Figure 8.8, 8.9).

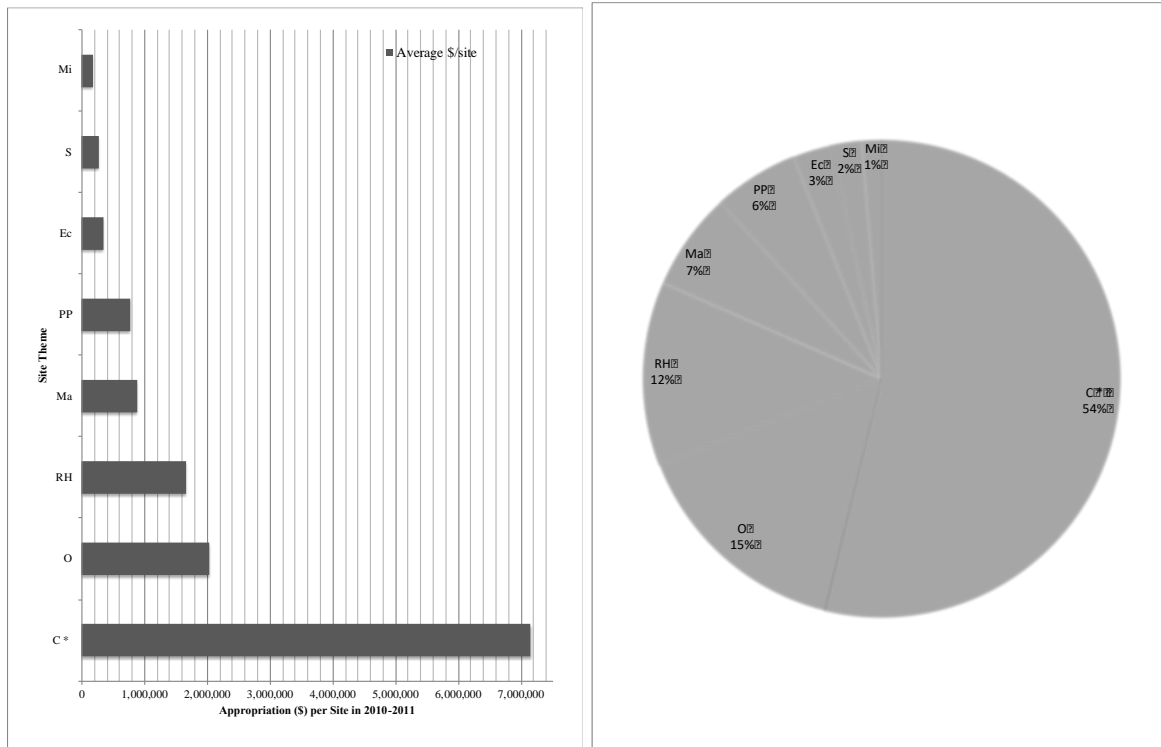


FIGURE 8.8 (left). Appropriations (\$) per DCR Site by theme. (Figure by author, data source: NC PED 2012).

FIGURE 8.9 (right). Average appropriation per site for DCR sites by theme as percentage of total DCR average appropriation per site in 2010-2011 (n=\$13,282,743). (Figure by author, data source: NC PED 2012).

Key: C* = Cultural (non-A&H site Museum of Art); O = Other (e.g. general management and administration); RH = Regional History; Ma= Maritime; PP = People-Place; Ec= Economy; S=Settlement; Mi=Military.

APPROPRIATIONS R\$ FOR A&H STATE ATTRACTIONS BY REGION: 2010-2011

In 2010/2011 of the 33 A&H sites across North Carolina, 16 sites (48%), in the Coastal Plain collectively received in total approximately 40% of DCR’s total annual appropriation (n=\$28.8 million). Twelve A&H sites in nine OBX Counties received approximately 33% of the total DCR appropriation (n=\$28.8 million) in 2010/2011 or approximately 90% of the A&H appropriation to Coastal Plain counties. Four historic sites, Somerset Place (Washington/Tyrrell), Historic Brunswick/Fort Anderson (Brunswick), Historic Bath (Beaufort), and Fort Fisher (New Hanover) all received about 1%. The Maritime Museum in Southport (Brunswick) and Graveyard of the Atlantic Museum (Dare) also received approximately 1%. The Maritime

Museum in Beaufort (Carteret) and Museum of the Albemarle (Pasquotank) each received approximately 3.5%, and Roanoke Island Festival Park (Dare) just over 6%. Coastal Plain IBX sites received on average \$0.25 million per site and those in OBX counties on average \$0.79 million per site (Table 8.2, Figures 8.10, 8.11).

DCR A&H sites 2010-2011	No. of Sites	% of Total A&H Sites	Total Expenditures \$	Revenue \$	Net Expenditure = Appropriation \$	Appropriation as % of Total DCR \$
Mountains (M)	3	9%	594,435	13,761	580,674	2%
Piedmont (P)	14	42%	8,615,602	170,015	8,445,587	29%
Coastal Plain Inner Banks (CP IBX)	4	12%	1,030,351	9,710	1,020,641	4%
Coastal Plain Outer Banks (CP OBX)	12	36%	14,155,969	4,584,065	9,571,904	33%
Totals for A&H Sites by Region	33	100%	24,396,357	4,777,551	19,618,806	68%
Total DCR All Depts			34,000,000	5,200,000	28,800,000	100%
Average \$ per site in M region	1		198,145	4,587	193,558	1%
Average \$ per site in P region	1		615,400	12,144	603,256	2%
Average \$ per site in CP IBX	1		257,588	2,428	255,160	1%
Average \$ per site in CP OBX	1		1,179,664	382,005	797,659	3%
Average \$ total all A&H sites	1		739,284	144,774	594,509	2%

TABLE 8.2. Appropriations received by DCR/A&H Sites in 2010/2011 by region. (Table by author, data source: NC PED (2012)).

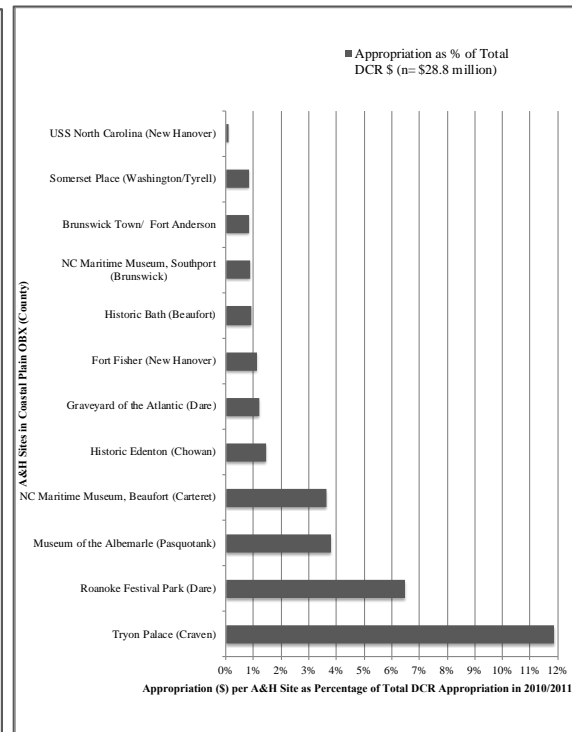
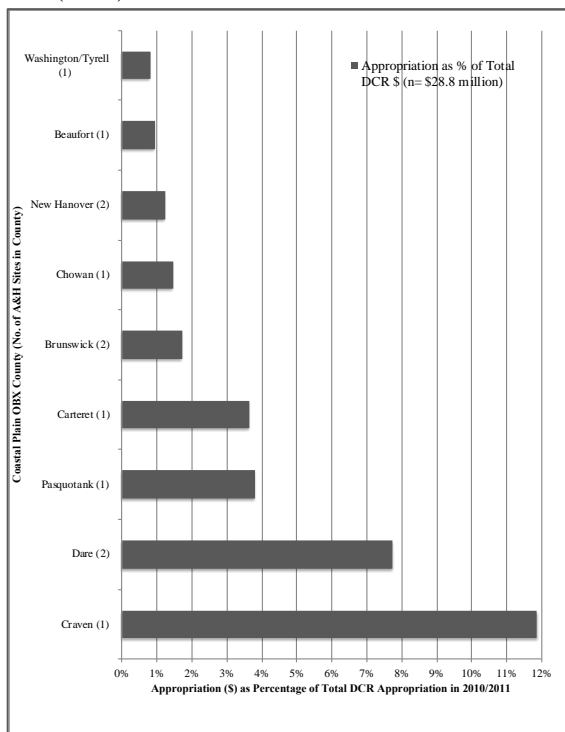


FIGURE 8.10 (left). Appropriations for A&H Sites in OBX counties as percentage of total DCR appropriation (n=\$28.8 million) in 2010/2011. (Figure by author, data source: NC PED (2012)).

FIGURE 8.11 (right). Appropriations for A&H Sites in OBX counties as percentage of total DCR appropriation (\$28.8 million) in 2010/2011. (Figure by author, data source: NC PED (2012)).

Political Interest: Legislation for Six UCH Sites and ASAs: 1960-2017 Period Totals

One of the indicators for *political interest* in the six UCH sites and ASAs was related numbers of North Carolina state legislations. Data sources, which included NC Session Laws accessed by the author at the NC State Legislature’s website in 2017-2018. In total almost 29,000 Session Laws were found listed for the period 1959 to 2017. Twenty-Five Acts related to three of the six UCH sites: 14 (56%) to *Queen Anne’s Revenge*; eight (32%) to *CSS Neuse*; and three (12%) to *Modern Greece*. No NC Session Laws were found relating to *USS Huron*, *Lake Phelps canoes*, to *Corolla shipwrecks generally*, or to the “George Browne” Wreck on *Corolla Beach* in particular. Forty-nine Acts related to the ASAs: nine (18%) to *Fort Fisher Historic Site*; eight (16%) to *CSS Neuse Historic Site*; ten (20%) to *Pettigrew State Park*; four (8%) to *Jockey’s Ridge State Park*; 14 (28%) to *NC Maritime Museum*; and four (8%) to *Graveyard of the Atlantic Museum* (Figure 8.12; Appendix F).

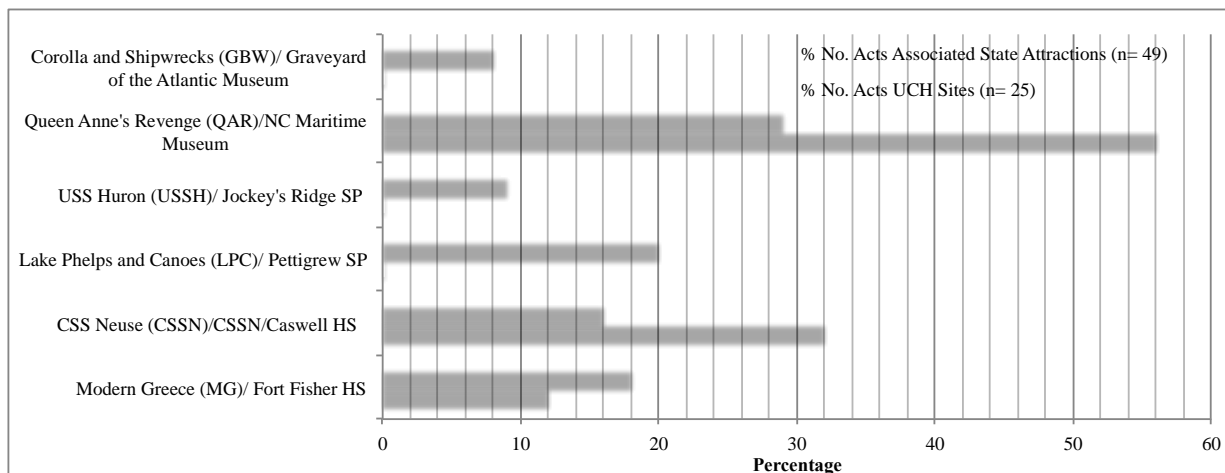


FIGURE 8.12. Legislation Acts for six UCH sites and ASAs 1960-2017. (Figure by author, data source: North Carolina Session Laws).(per UCH site/ASA: lower bar=No. Acts/UCH sites; upper bar= No. Act/ASA).

The average number of laws (Acts) per year for each UCH Site, and each ASA, since each came under A&H were calculated. For *Modern Greece* over 55 years there were on average 0.05 Acts per year; for *CSS Neuse* over 54 years 0.15 Acts per year; and for *Queen Anne’s*

Revenge over 21 years 0.7 Acts per year. For the ASAs, Acts per year were: 0.15 for Fort Fisher Historic Site over 57 years; 0.15 for CSS *Neuse* Historic Site over 51 years; 0.18 for Pettigrew State Park over 56 years; 0.09 for Jockey's Ridge State Park over 42 years; 0.42 for NC Maritime Museum over 33 years; and 0.26 for Graveyard of the Atlantic Museum over 15 years.

Political Interest: Appropriations for Six UCH Sites and ASAs: 1960-2017 Period Totals

The other indicator for levels of *political interest* in the six UCH sites, and ASAs for which the author sought data was the amount of state appropriations - recurring (R\$) and non-recurring (NR\$) to each. Data sources searched included: A&H Biennial Reports, NC Session Laws, NC Office of State Budget and Management Certified Budgets (OSBM), A&H/OSA/UAB site archives and some newspaper reports.

Recurring (R\$) Appropriations for Six UCH Sites and Six ASAs

From 1960 to 2017 A&H received in total almost \$700 million; approximately 0.16% of the total NC General Fund (GF) over this time. Most of A&H's annual recurring appropriations (R\$) went to fund permanent staff positions. For most of this period, A&H's Historic Sites section received between 30% and 40% of A&H's total budget. A&H's Office of State Archaeology (OSA) staff includes archaeologists and conservators. Appropriations to OSA were only given in A&H Biennial Reports for the years when it was a distinct section (1973-2001).

Recurring Appropriations R\$ for Six UCH Sites

In A&H Biennial Reports, R\$ apportionment to individual projects, such as the six UCH sites, was not recorded. A&H staff may work on more than one project at a time, but projects are not accounted or reported separately. For example, during the 2002-2004 biennium, in addition to monitoring the QAR site (sea bed inspections before and after Hurricane Isabel in September 2003), the state's underwater archaeologists participated in 44 other field projects and site

inspections, which included documenting fragments of CSS *Neuse's* casemate in the river near Kinston (A&H 2004:31). For this study, however, total R\$ appropriations received since they became an A&H management responsibility were estimated by the author for three of the UCH sites; *Modern Greece*, CSS *Neuse* and *Queen Anne's Revenge*:

Total R\$ appropriation for *Modern Greece* was calculated as the product of the approximate number of full time equivalent (FTE) permanent staff (OSA underwater archaeologists and conservator) multiplied by their estimated total salary (assuming this was the same over the whole period), multiplied by the number of years the project was active. A total R\$ for *Modern Greece* over 16 years (1963-1977) was thus estimated at \$80,000 by assuming all R\$ funded one FTE staff position at \$5,000 per annum for this period. Since publication of the report on *Modern Greece* (Bright 1977) and most of the remaining artifacts have been in long-term wet storage, and relatively little A&H/OSA staff time has been allocated to the site or its finds, so zero FTE staff costs were assumed.

In 2010/2011, the CSS *Neuse*/Fort Caswell Historic Site received R\$ appropriation of \$297,194 (NC PED 2012). Assuming no change in this amount over the previous 54 years, an estimated total R\$ for CSS *Neuse* was calculated by multiplying \$297,194 by 54 years, for a total estimated R\$ appropriation for this historic site – which included CSS *Neuse* until 2012 - of approximately \$16.05 million.

From the OSA/UAB archives, the author was able to collect data on funding from all sources for the *Queen Anne's Revenge* Project (QAR) from 1996/1997 to 2015/2016 (Appendix F) of which total R\$ appropriations over 21 years were calculated as approximately \$4.2 million.

In total these three UCH sites received approximately \$20 million in R\$ appropriations from 1960 to 2017 or approximately 3% of A&H's total approximate appropriation of \$700

million over the same period. Of this \$20 million over 16 years *Modern Greece* received an estimated \$80,000 (less than 1%), CSS *Neuse* over 54 years received an estimated \$16.05 million (c. 80%), and QAR over 21 years received approximately \$4.5 million (22%).

The average R\$ appropriation as calculated above, received by each UCH site as an average per year for the total number of years each has been under A&H management was therefore: \$1,454 per year for *Modern Greece*; \$297,000 per year for CSS *Neuse*; and \$214,285 per year for QAR. Therefore, for these three sites, on the basis of both total and average R\$ appropriations per year, there was most political interest in CSS *Neuse*, and least in *Modern Greece*. There was no political interest in the other three UCH sites (Lake Phelps canoes, USS *Huron*, “George Brown” wreck) based on zero R\$ being received (at least as found by the author).

Recurring Appropriations R\$ for Six ASA Sites

For the six ASAs approximate total R\$ appropriation values were calculated by multiplying the R\$ reported for 2010/2011 in the NC PED (2012) report by the number of years each was under DCR/A&H or DENR management – assuming this level of appropriation was unchanged over this time. By this calculation estimated total R\$ appropriation received by: Fort Fisher Historic Site was \$18.7 million over 57 years; CSS *Neuse*/Caswell Historic Site was \$16.3 million over 51 years; NC Maritime Museum was \$27 million over 20 years; Jockey’s Ridge State Park was \$19 million over 42 years; Pettigrew State Park was \$18.5 million over 57 years; and Graveyard of the Atlantic Museum was \$3.5 million over 15 years. The calculated average R\$ per year for each was thus approximately: Fort Fisher Historic Site \$328,000; CSS *Neuse* Historic Site \$319,000; NC Maritime Museum \$1.35 million; Jockey’s Ridge State Park \$452,000; Pettigrew State Park \$319,600; and Graveyard of the Atlantic \$233,000.

Non-Recurring (NR\$) Appropriations for Six UCH Sites and Six ASAs

Data on non-recurring appropriations (NR\$) to some of the UCH sites and ASAs was found by the author in NC Session Laws and A&H/OA archives (Appendix F). In some years A&H sites, historic sites, museums received NR\$ appropriations for special projects and operational costs. For example, in the 1962-1964 biennium by enabling legislation provided a NR\$ appropriation of approximately \$25,000 for *Modern Greece* and other Civil War shipwrecks (NC 1963). In 2015-2017, there was a NR\$ appropriation of \$1.5 million for QAR (NC 2015).

Non-Recurring Appropriations NR\$ for Six UCH Sites

From data found, NR\$ appropriations in total received by three of the UCH sites between 1960 and 2017 was calculated as approximately \$7.5 million of which: CSS *Neuse* over 54 years received approximately \$4.05 million (54%); QAR over 21 years received \$3.4 million (45%); and *Modern Greece* received \$0.05 million (1%) over 55 years (Figure 8.13).

The average NR\$ appropriation per year as calculated was: for CSS *Neuse* approximately \$75,000; for *Modern Greece* \$909; and for QAR \$161,900. On the basis of this calculated average NR\$ appropriation per year of these three UCH sites, there was most *political interest* in QAR and least in *Modern Greece*. As no data was found for NR\$ for the other three UCH sites (Lake Phelps canoes, USS *Huron*, “George Browne” Wreck) by this measure (NR\$) it appears there was no *political interest* in them.

Non-Recurring Appropriations NR\$ for Six ASAs

Six ASAs received in total approximately \$28.7 million in NR\$ over 57 years (1960-2017). Of this total Fort Fisher Historic Site received approximately \$14.3 million (50%) over 57 years, CSS *Neuse* Historic Site received \$4.0 million (14%) over 51 years, NC Maritime

Museum \$3.75 million (13%) over 34 years (1984-2016), Pettigrew State Park \$3.0 million (10%) over 57 years, Jockey’s Ridge State Park \$0.75 million (3%) over 42 years, and Graveyard of the Atlantic Museum \$2.7 million (9%) over 15 years (Figure 8.13).

The average NR\$ per year calculated for each ASA was for: Fort Fisher Historic Site \$250,877; CSS *Neuse* Historic Site \$78,431; NC Maritime Museum \$110,294; Pettigrew State Park \$52,631; Jockey’s Ridge State Park \$17,857; and Graveyard of the Atlantic Museum \$180,000. On the basis of this calculated average NR\$ per year for the ASAs, there was most political interest in Fort Fisher Historic Site, and least interest in Jockey’s Ridge State Park.

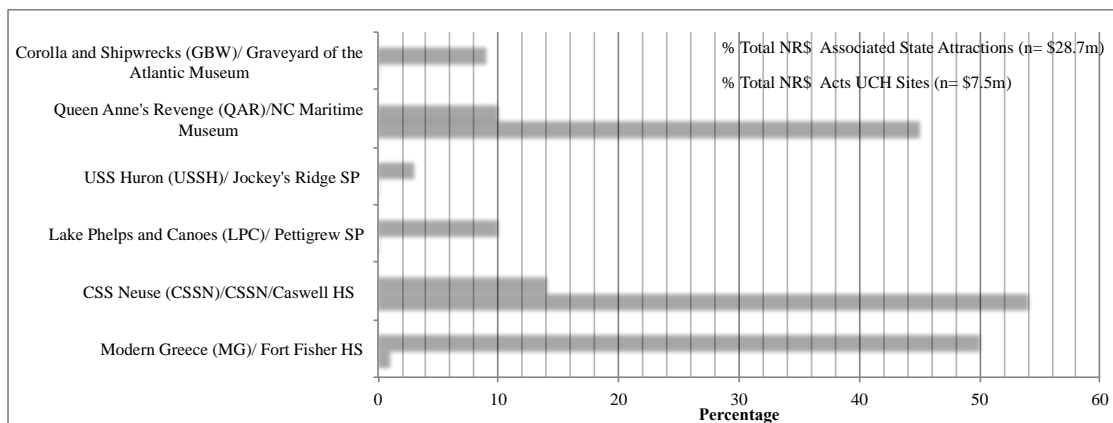


FIGURE 8.13. Percentages of total non-recurring appropriations (NR\$) for six UCH sites and ASA. (Figure by author, data as calculated and estimated by author: data sources: North Carolina Session Laws (1960-2017); NC A&H Biennial Reports 1960-2016; NC PED (2012). (per UCH site/ASA: lower bar= NR\$ Acts/UCH site; upper bar= NR\$ Acts/ASA).

Summary

This chapter, described results of the author’s investigation of levels of *political interest* in North Carolina for history and UCH generally since the early 1960s, and in relation to the six case study UCH sites and ASAs in particular. Indicators for levels of *political interest* were numbers of state legislative Acts and amounts of appropriations – both recurring (R\$) and non-recurring (NR \$) on the assumption that the greater the level of *political interest* the more legislation enacted and more funding appropriated for particular programs or projects. The chapter first reviewed the state government and legislative framework in North Carolina, as it

relates to history, UCH, and its public agency for Archives and History (A&H). The second part of the chapter described and compared levels of state funding for A&H in general, and for the six UCH case studies. Period totals for indicator data collected were calculated and described.

Archives and History (A&H) was established in 1903 (NC 1903, 1907). The first legislation relating to UCH was in 1963 (NC 1963) to establish a Preservation Lab, to conserve artifacts recovered from *Modern Greece* and other blockade-runner shipwrecks. In 1967, A&H was further authorized to conduct and/or supervise "...surveillance, protection, preservation, survey and systematic archaeological recovery of underwater materials" (NC1967). As indicated by numbers of legislations found by the author, there was most interest in QAR (0.7 laws per year) and least in Lake Phelps Canoes, USS *Huron*, and for Corolla Shipwrecks (of which the George Browne Wreck was one) (no session laws found). For ASAs, most political interest was in NC Maritime Museum (0.42 per year) and least in Jockeys Ridge State Park (0.09 per year). This despite the latter being the most visited state-run attraction in North Carolina in 2010-2011 (Figure 7.23; NC PED 2012).

State legislation for A&H includes for recurring R\$ and non-recurring NR\$ appropriations from the General Fund (GF). From 1949-1950 to 2013/2014 R\$ in total to A&H was \$680 million, approximately 0.16% of the GF total budget. Since 1959-1960, for A&H's historic sites section total average R\$ appropriation as a percentage of the average total A&H R\$ appropriation was approximately 33%, for NC Maritime Museum in Beaufort 10%, and for Archaeology (OSA) 5%.

By average R\$ appropriations per year calculated by the author there was most *political interest* in CSS *Neuse* (\$297,000 per year) and least in Lake Phelps Canoes, USS *Huron*, and any Corolla Shipwrecks (all with none). By average NR\$ appropriations per year calculated there

was most political interest in *Queen Anne's Revenge* (\$161,000 per year) and least in Lake Phelps Canoes, USS *Huron*, and Corolla Shipwrecks (all with none). For ASAs, there was most *political interest* by R\$ in NC Maritime Museum (\$1.35 million per year) and least in Graveyard of the Atlantic Museum (\$233,333 per year). By NR\$ there was most interest in Fort Fisher Historic Site (\$255,877 per year) and least in Jockeys Ridge State Park (\$17,857).

As calculated from data in NC PED (2012) report, in 2010/2011 approximately, 68% of DCR's total appropriation (\$28.8m) was allocated to A&H, of which approximately 29% was allocated to seven museums and 18% to 22 historic sites (NC PED 2012). Of 33 A&H sites those categorized as *military* by the author received about 5% of DCR's appropriation. Four maritime themed sites located in the Coastal Plain OBX counties received about 12%, of which in total Roanoke Island Festival Park received 55%. Average appropriation per A&H site by theme as a percentage of total DCR average appropriation was for *regional history* 12%, *maritime* 7%, *people-place* 6%, *economy* 3%, *settlement* 2%, and *military* 1%. Sixteen A&H attractions located in the Coastal Plain region received approximately 40% of DCR's annual appropriation; 90% of which went to 12 sites in nine Coastal Plain OBX counties. Coastal Plain IBX sites received on average \$0.25 million per site and those in the OBX on average \$0.79 million per site.

In the following chapter levels and areas of *professional interest* in history, remains of the past, UCH, and the six UCH case study sites in North Carolina are described, characterized and compared, as indicated by activities of A&H's professional staff since the early 1960s.

CHAPTER 9

PROFESSIONAL INTEREST IN PRESERVING HISTORY AND PHYSICAL REMAINS OF THE PAST IN NORTH CAROLINA

“There is not a county in North Carolina that does not have a history well worth recording”
(NCHC Biennial Report 1907:15).

Introduction

There has been *professional interest* in preserving and protecting North Carolina’s history and physical remains of its past since 1903, when state legislation established the state’s public agency for Archives and History (A&H) (NC 1903; NC 1907). Since 1963, A&H has been tasked also with conserving the state’s UCH (NC 1963, NC 1967). This chapter describes results of the authors’ investigation of levels of *professional interest* since the 1960s in North Carolina history and UCH in general and in relation to six UCH case study sites in particular.

The first part of the chapter defines the term professional and reviews professional activities of A&H as a public organization. Assuming the nature of an activity indicates levels of *professional interest* in it, the second part of the chapter describes and quantifies levels of activity in three A&H programs generally: the *North Carolina Highway Historical Marker Program* (NC HHM), North Carolina listings on the *National Register of Historic Places* (NC NRHP), and North Carolina *underwater sites* investigated by A&H. Primary sources used by the author for this part of the study were A&H created and maintained databases for: *North Carolina Highway Historical Markers* (NC HHM 2011, 2017), *North Carolina National Register of Historic Places* (NC NRHP 2016); and A&H Office of State Archaeology (A&H/OSA) 2011 *Underwater Sites Database* (NC A&H/OSA/UAB 2011). Secondary sources included A&H Biennial Reports and published histories of A&H including: Townsend (1963; 1965a, b; 1972), Watts and Bright (1973), Wegner (2003), and Lawrence (2011).

In the third part of the chapter data collected for two indicators for levels of *professional interest* in the six UCH sites in particular are described and analyzed by period totals. This indicator data was numbers of publications found by keyword searches of *Google Scholar* online database, and numbers of references listed (for each site) in the 2016 *Bibliography of Underwater Archaeology* (NC A&H/OSA/UAB 2016). In Chapter 10, changes over time in levels of *professional interest* as indicated by data collected are described and analyzed.

Professionals and North Carolina's Public Agency for Archives and History

The term *professional* has been defined as those who: apply skills based on theoretical knowledge following advanced education and training; have had their competence in these skills and knowledge tested through examination or other methods of accreditation; belong to a professional association, with a code of conduct they identify with and adhere to; espouse altruistic and equality of service, and regard their profession as a life's work or calling; believe in autonomy in their work activities and decision-making; and professional standards are maintained by self-regulation and collegially by fellow professionals. Management researchers have found that such *professionals* play key roles within public organizations and that their values and beliefs more often support than conflict with those of a public sector service organization (Rainey 2009:304-305).

Professional staff of A&H at the time of this study included historians, museum curators, archaeologists, and conservators. In 2010, A&H had a staff of approximately 600. In 1910 there were just three (Figure 9.1). The greatest percentage increase (over 350%) in staff was from 1950 to 1960 (Figure 9.2). During this decade the agency's role and responsibilities expanded to include historic sites following legislation enacted in 1955 (NC 1955). By 2014-2015 the total

staff of A&H was 407.6 full-time equivalent (FTE) positions. Historic Sites had the largest staff of 127 (31%). In A&H/OSA there were 16.76 (4%) (NC OSBM 2013).

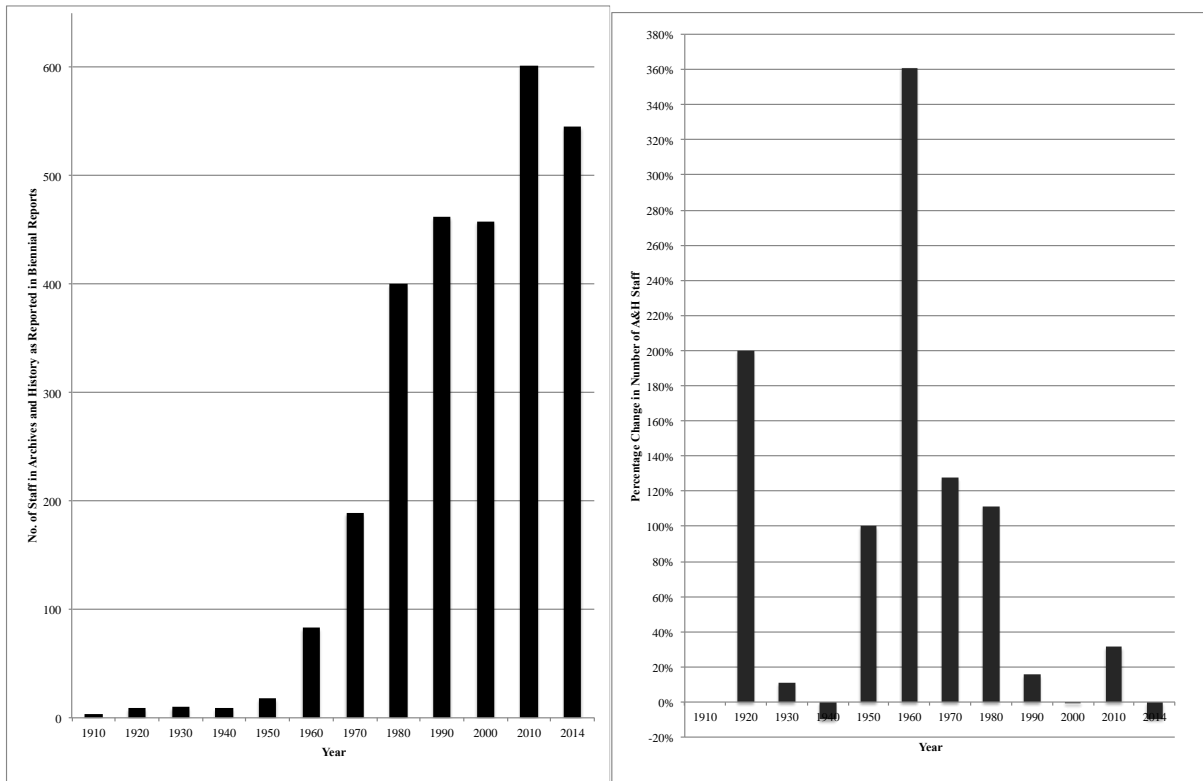


FIGURE 9.1. Number of A&H staff 1910 to 2014. (Figure by author, data source: NC A&H Biennial Reports).
 FIGURE 9.2. Decade-to-decade percentage change in number of A&H staff 1910 to 2010, and in 2014. (Figure by author, data source: NC A&H Biennial Reports).

Almost from the moment of its establishment, the role, administration, management and independence of A&H as an organization of professionals within state government has been debated and challenged. From the 1920s, repeated proposals to subsume the agency within a larger department were much resisted as such reorganization was seen as threatening the professional integrity of its staff if they were to be under the direction of a politically appointed agency head (Johnston 1979:10-14). A review of A&H’s functions and duties in the mid-1950s supported its autonomy. The Commission on Reorganization of State Government concluded, “In the absence of substantial evidence that another method of preserving the state’s historical

heritage is more desirable, we have preferred to recognize this function as a separate governmental activity” (Johnston 1979:11).

In 1955, review and reclassification of positions and the requirement of a four-year college degree with a major in history or other related field for professional level positions further confirmed A&H’s professional standing (Wegner 2003:34-37). When North Carolina’s state government was reorganized in the early 1970s, however, the agency, as the Office of Archives and History (A&H), became a section within a newly established Department of Cultural Resources (DCR) (NC 1971a, b). Since then the Department’s head, the “Secretary”, is a governor appointed position and likely to change with a change of Governor. The head of A&H, the Deputy Secretary, is a professional appointee and generally has not been replaced with each legislature administration change.

Since 1903, A&H’s professional staff activities have been undertaken to implement its responsibilities and duties as required by state and federal legislations. For example, in response to its duty to encourage historical research and investigation, its staff work with knowledgeable individuals, local and county associations, and societies. To encourage study of North Carolina history in schools its staff work with teachers and provide educational materials. To fulfill its duty to mark and preserve battlefields, houses and other places important to the history of the State, staff researches and erects memorials to commemorate “eminent sons of the State” and to mark sites of historic events. In doing all these activities A&H professional staff invariably cooperate with local, state, and national agencies, non-profit organizations and with the public (NC HC 1907:13-16).

North Carolina Highway Historical Marker Program (NC HHM)

In 1935, state legislation established North Carolina's *Highway Historical Marker Program* (NC HHM) to standardize marking sites of statewide historical significance, commemorating people and events (NC 1935b; McCoy 1938; NC HHM 2011). The program was to be implemented through A&H. The markers were seen as having an educational and economic role. For A&H's then Secretary, Christopher Crittenden, they provided a "...history for all the people" (Wegner 2003:23). As reported by McCoy (1938) in the *New York Times* they were also a means to "lead tourists to storied sites" and to help motorists to "...find the more outstanding points of historic interest in the State...the motorist making a tour of the Old North State has a chance to learn with the help of the markers, about some of the people and events that aided in shaping American history" (McCoy 1938).

The 1935 legislation also established a committee of professional historians to advise the head of A&H "... on the historical authenticity, relative merit, and appropriateness of each subject brought to their attention; to approve or disapprove each proposal; to fix the wording of the inscriptions; and to establish criteria for carrying out the program" (NC HHM 2011). While anyone can submit a suggestion for a marker the committee's approval is needed before any are erected (Wegner 2003:19; NC HHM 2011). Members of the committee are professional academic historians at the state's universities with expertise in various aspects of North Carolina's history. Implementing the NC HHM program is currently the joint responsibility of A&H and of the NC Department of Transportation's (NC DOT) Division of Highways, Traffic Engineering Branch.

The markers are instantly recognizable by their standard size, shape, color and format. They are in aluminum, painted silver with black lettering, and have the state seal at the top,

flanked by letter code for county on left and marker number on the right (McCoy 1938; NC HHM 2011). Markers are positioned at the side of North Carolina highways at or close to a location associated with a person and/or event of sufficient statewide significance to be commemorated. The first marker (G-1) was erected January 1936 in Stovall, Granville County near the home of John Penn, who was one of the signers of the Declaration of Independence (NC HHM 2011). In 2012, marker (D-113) to commemorate the shipwreck *Modern Greece* and establishment of the state's first Preservation Laboratory, was erected at Kure Beach, New Hanover County (Figure 9.3).



FIGURE 9.3. North Carolina Highway Historical Marker D-113 for *Modern Greece* (Image source: http://www.ncmarkers.com/marker_photo.aspx?sf=a&id=D-113).

The titles and text on markers, as well as additional essays expanding the story told, are on file in A&H and in an online searchable database at www.ncmarkers.com. This database includes 121 keywords or “tags” by which it can be searched. Assuming casting of a marker was close to when the committee agreed the marker proposal, casting dates can be taken as an indication of A&H professionals’ interests and of what was considered most significant at the

time. A critical discourse analysis of the texts and titles of North Carolina’s Highway Historical Markers was undertaken by the author to investigate the extent of A&H *professional interest* in maritime history and its physical remains as evidenced by sites and events commemorated. The NC HHM database was searched for markers under the database’s “maritime” keyword in March 2011 and in April 2017 (NC HHM 2011). Markers found by these searches were categorized (in Excel) by location, date cast, and theme (Appendix G).

Geographic Locations of NC Highway Historical Markers

In April 2017, there were 1,580 Highway Historical Markers listed in the NC HHM online database, with at least one marker in each of the state’s 100 counties. Approximately 50% of counties had between 6 and 15 markers (Figure 9.4). There were 683 markers (43%) in 41 Coastal Plain counties (Figure 9.5).

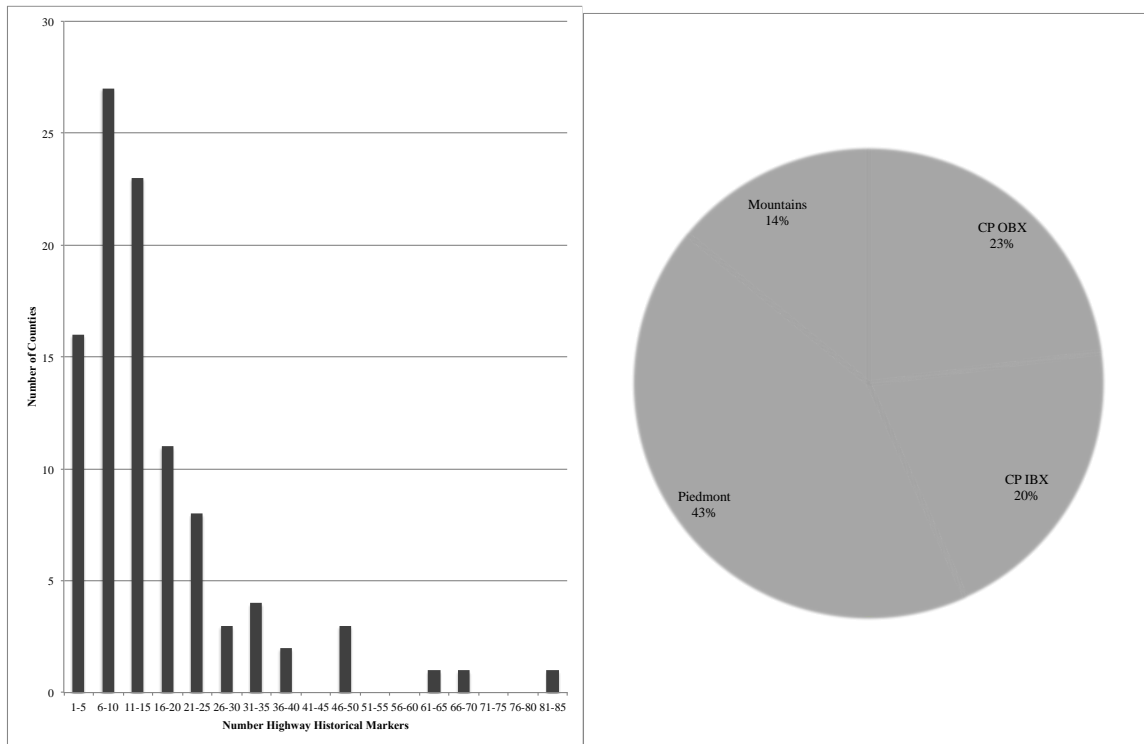


FIGURE 9.4 (left). Frequency of Highway Historical Markers by number of counties. (Figure by author, data source: NC HHM database (2017)).

FIGURE 9.5 (right). Percentage of total number (n=1580) of North Carolina Highway Historical Markers by region in April 2017. (Figure by author, data source: NC HHM database (2017)). Key: CP = Coastal Plain.

In 2017 in IBX counties, Halifax and Cumberland had the most markers per county with 47 and 46 respectively (Figure 9.6). Twenty-three percent (361) of all markers were in the 20 OBX counties. In OBX counties, there were most markers in New Hanover (63), Craven (38), and Beaufort (31). OBX counties with the fewest markers, just one in each, were Pamlico and Tyrrell counties (Figure 9.7). By comparison there were approximately 680 markers (43%) in Piedmont region counties and 221 markers (14%) in Mountain region counties.

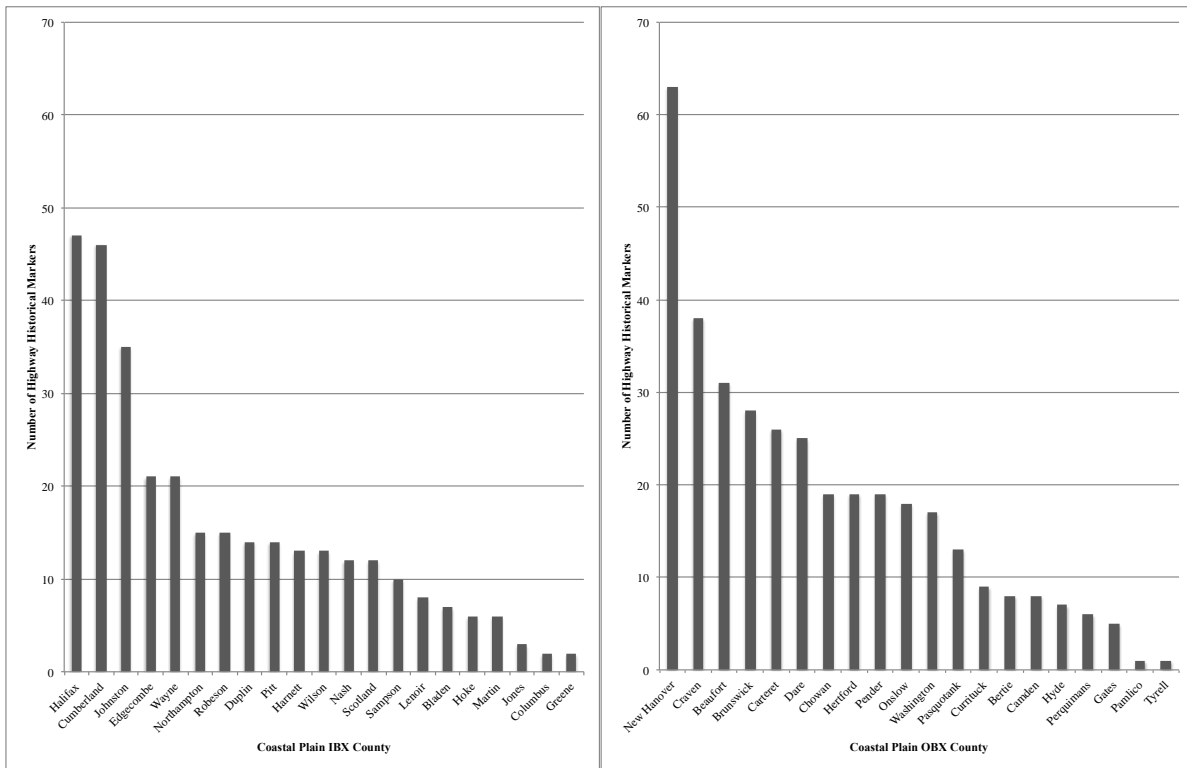


FIGURE 9.6 (left). North Carolina Highway Historical Markers in Coastal Plain IBX counties.
 FIGURE 9.7 (right). North Carolina Highway Historical Markers in Coastal Plain OBX counties (Figures by author, data source: NC HHM database (2017)).

North Carolina Highway Historical Markers with a Maritime Theme

At the end of 2010, there were 1,526 markers listed in the NC HHM database (NC HHM 2011). Of these 114 (7.4%) had a “maritime” theme. None of the markers, in neither title nor text, actually used the word “maritime”, this being solely a keyword assigned by the NC HHM Program to facilitate theme-based searches of the database. Of these 114 maritime markers, 100

(88%) were in Coastal Plain counties (Figure 9.8). Eighty-three (73%) were in 16 of 20 OBX counties (Figure 9.9). OBX counties with the most maritime markers were Dare (13), New Hanover (12), Carteret (10), Brunswick (9) and Beaufort (8). Four counties (Pasquotank, Perquimans, Pamlico, and Tyrrell) had no maritime markers. There were also maritime markers in the Piedmont region (11%) and some (1%) in Mountain region counties.

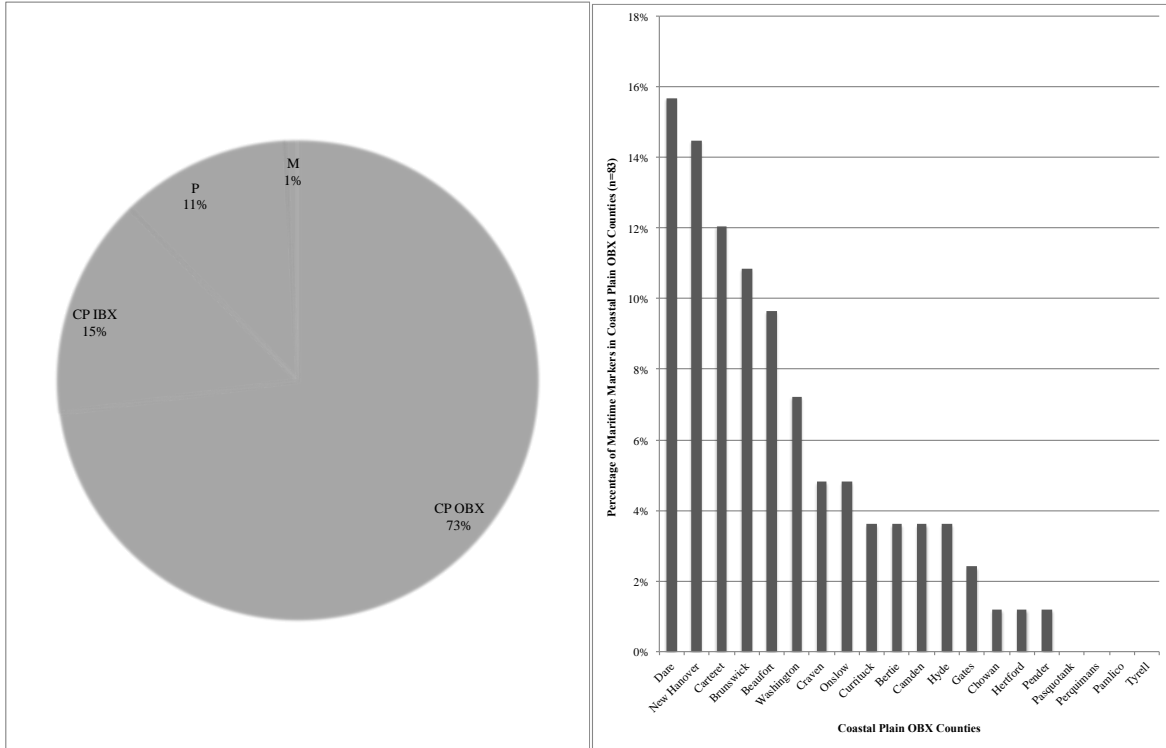


FIGURE 9.8 (left). Frequency of Highway Markers characterized by keyword “maritime” as assigned in NC HHM database (2011) by region as percentage of total number of maritime markers (n=114). (CP OBX = Coastal Plain Outer Banks; CP IBX = CP IBX; P = Piedmont; M= Mountains).

FIGURE 9.9 (right). Percentage of maritime Highway Markers in OBX counties (n=83). (Figures by author, data source: NC HHM Database (2011)).

To investigate what maritime stories and events were considered significant enough to be commemorated, a critical discourse analysis of the title and text of each of the 114 maritime markers was undertaken. The “maritime” markers were grouped by the author into one of seven possible theme categories: *economy*, *leisure*, *government*, *military*, *pirates*, *place*, and *science* (Figure 9.10; Appendix G). Fifty-seven maritime markers (50%) had an overall *military theme*. These variously related to coastal forts, battles to defend forts, canals, and other water places,

and ships built and lost. The latter included a marker in Kinston (F-15) cast in 1940 to commemorate the Confederate “Ram Neuse”. Just one marker commemorated a woman – Rose Greenhow a Civil War spy who drowned off Fort Fisher. The marker (D-57) close to her gravesite in Wilmington was cast in 1955.

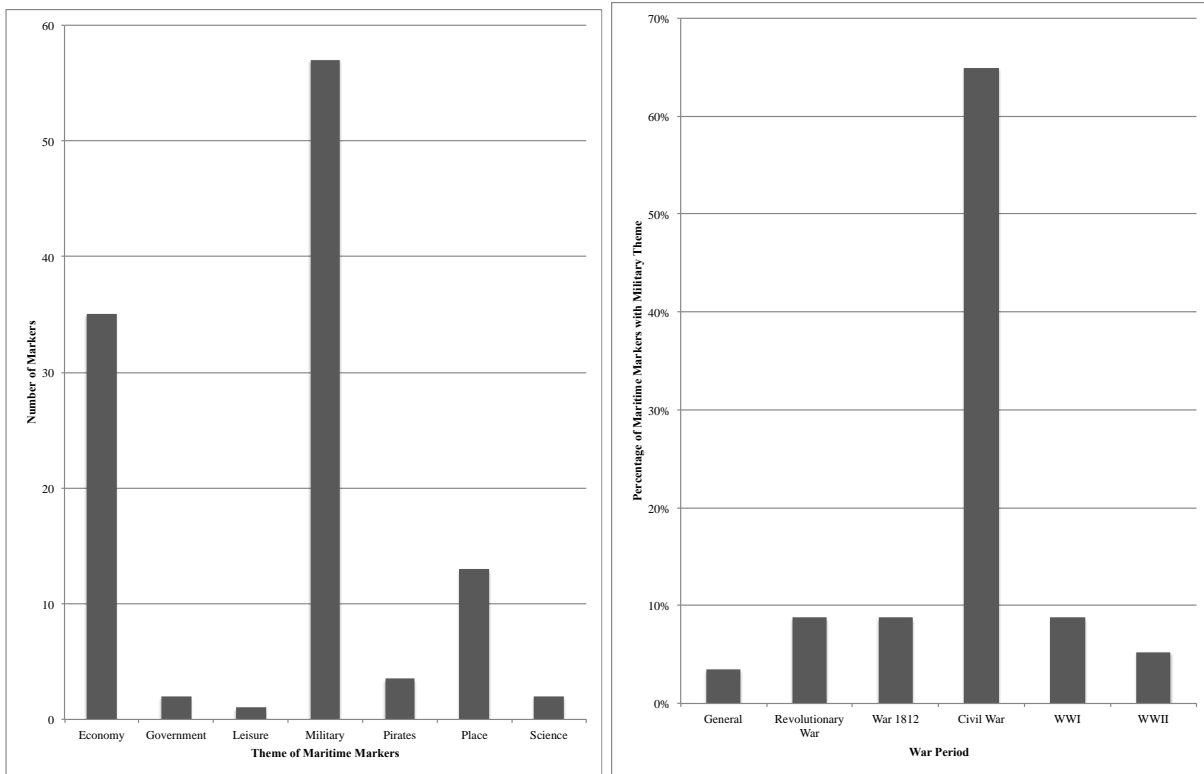


FIGURE 9.10 (left). Frequency of maritime markers by sub-themes (n=114) in NC HHM database (2011). (Figure by author, data source: NC HHM database (2011)).

FIGURE 9.11 (right): War period commemorated as percentage of total number maritime markers with military theme (n=57). (Figure by author; data source: NC HHM database (2011)).

Military themed markers were further categorized as: Revolutionary War, War of 1812, Civil War, World War I, or World War II. Thirty-seven (65%) of 57 markers with a *military* theme related to the Civil War (Figure 9.11). Of these 14 (38%) were cast 1961-1962, at the time of the 100th Anniversary of the Civil War. Ten (27%) of *military* themed markers were among the first markers cast between 1936-1939 (Figure 9.12). Fifty-two (93%) of *military* markers were in Coastal Plain counties (Figure 9.13).

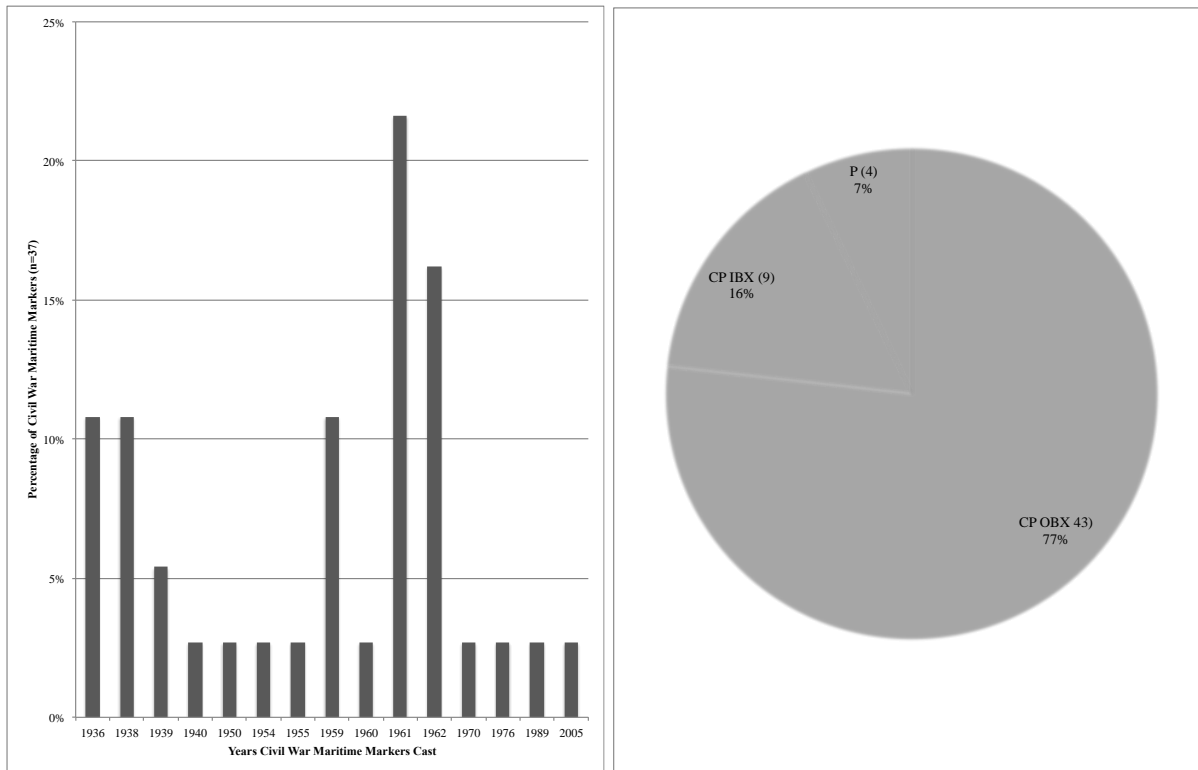


FIGURE 9.12 (left). Percentage of Civil War maritime markers (n=37) and years cast.

FIGURE 9.13 (right). Frequency of maritime/military/Civil War theme Highway Markers by region as percentage of total number of military markers (n=57). (Figures by author, data source: NC HHM database (2011)).

There were nine markers in six IBX counties: Halifax (two Civil War), Johnston (one Civil War), Lenoir (two Civil War), Martin (one Civil War), Northampton (two WWI), and Wayne (one Civil War). Forty-three (77%) were located in 11 of 20 OBX counties. The most *military* themed markers were New Hanover County (11) and Dare County (9). Twenty-seven (63%) of markers in OBX counties were related to the Civil War and located in nine counties, with the most in New Hanover (6), and Dare (6) (Figure 9.14).

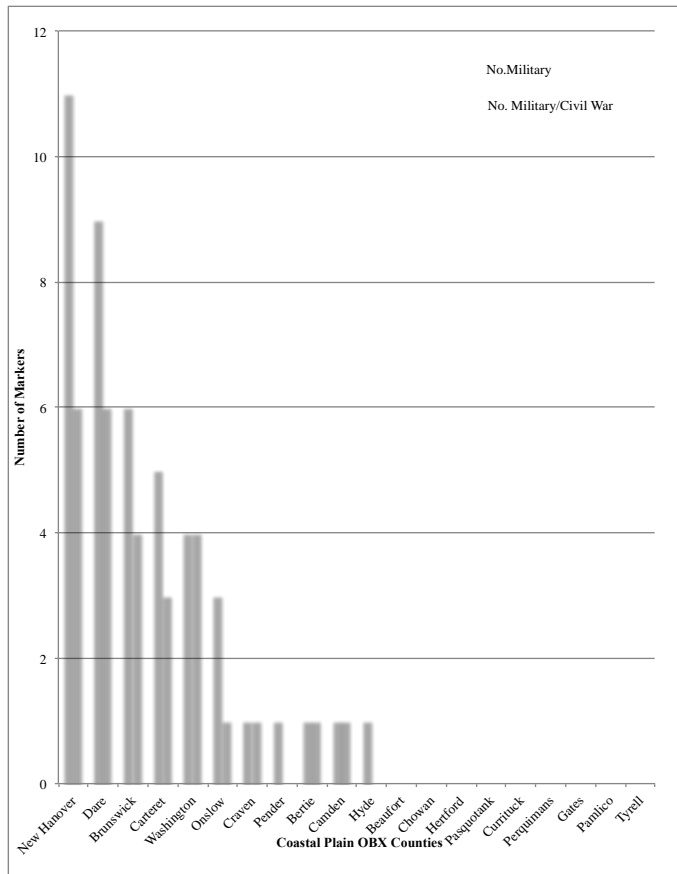


FIGURE 9.14. Frequency of military and military/Civil War themed Highway Markers in Coastal Plain OBX counties. (Figure by author, data source: NC HHM database (2011)) (per county: left column=no. military markers; right column=no markers military/Civil War).

Thirty-five (31%) of all maritime markers had an *economy* theme (Figure 9.10). These included those marking ports, fisheries, ferries, transport, shipyards, canals, locks, steamers, trade, agriculture, and lighthouses. Markers with a *place* theme recognized natural parts of the landscape, such as sounds, rivers and the establishment of towns and ports (for example Bath and New Bern). There were four markers with a *pirate* theme. Three related to Blackbeard; two in Ocracoke where he was killed, and one in Bath. One marker for Stede Bonnet was in Southport, near his 1718 base and location of capture. One marker with a *leisure* theme was for a touring theater boat that operated between 1913 and 1941 and for a while at Bath between 1913 and 1941. There were two *science* themed markers, including one near a site for extracting bromine from sea water in Beaufort. (Appendix G).

North Carolina Listings on National Register of Historic Places (NRHP): 1966-2016

Nationally by end of 2015 there were approximately 91,234 sites on the National Register of Historic Places (NRHP) (NPS NRHP 2015). By October 2016 there were 2,975 North Carolina sites listed (NC NRHP 2016). For this study, the NC NRHP online listing of North Carolina sites was copied into Excel and categorized by the author by history period, geographic location, and theme of sites. This was to investigate areas of A&H *professional interest* and what was regarded as of sufficient significance to be listed on the NRHP.

A nomination for listing a site on the NRHP includes: description of the property's setting, its physical characteristics and history, and demonstrates its "significance" and "integrity". *Significance* evaluation is under four criteria: A - association with events that made a significant contribution to history (national, state or local); B - association with a person who was significant to history; C - relation to a property having distinctive characteristics such as of a period, type, method, quality of construction, or artistic value; D - property or site yields or is likely to yield information important to history and prehistory. (NC NRHP 2017 Fact Sheet 2).

Archaeological sites are primarily listed under criterion D but may also be *significant* by one or more of the other criteria. *Integrity* of a property relates to its: location, design, setting, materials, workmanship, feeling and association. By this a property has to retain enough of its historic physical character or intact archaeological features (in the case of archaeological sites) to adequately represent its historic period and associations. (NCR 2017 Fact Sheet 2).

Geographic Locations of North Carolina Sites on the NRHP

There was at least one site in each of the state's 100 counties and 903 sites (30%) were in the 41 Coastal Plain (CP) counties (NCR NRHP 2016). Sixty percent (539) of sites were in IBX counties with most in Cumberland County (73 sites) and with fewest in Hoke County (5 sites)

(Figure 9.15). In OBX counties most sites were in Craven County (57 sites). OBX counties with the fewest listed sites were Tyrrell and Pamlico (Figure 9.16). Of all North Carolina listings 1,650 (53%) were in 36 Piedmont region counties and approximately 512 (17%) were in 23 Mountain region counties.

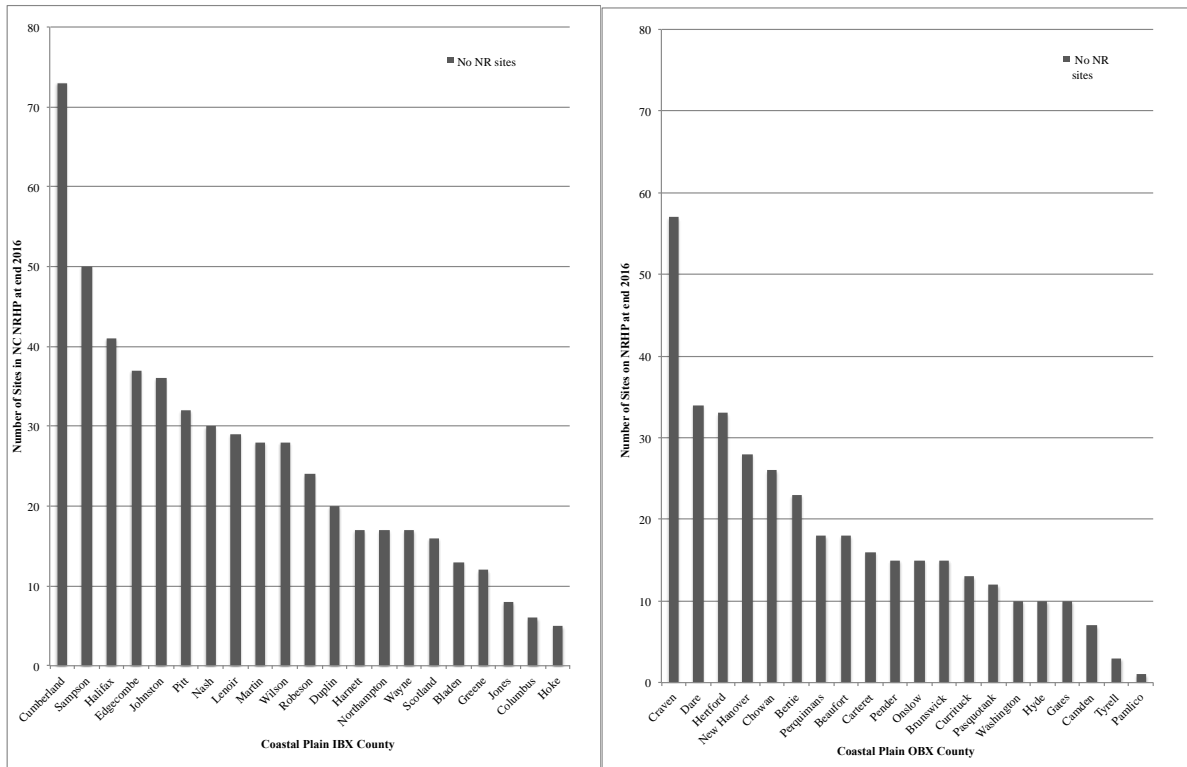


Figure 9.15 (left). Frequency of North Carolina National Register Historic Places in Coastal Plain IBX counties as at end 2016.

Figure 9.16 (right). Frequency of North Carolina National Register Historic Places in Coastal Plain OBX counties as at end of 2016. (Figures by author, data source: NCR NRHP (2016)).

North Carolina Sites on the NRHP by Theme

The author identified 11 themes by which sites were characterized for this study:

archaeology, archaeology UCH, economy, education, government, historic district, hospital, leisure, military, people-place, and religion. If a site’s description included the words *historic district, archaeology, or hospital*, it was categorized as such. The *economy* category included sites such as farms, plantations, factories, mills, taverns, stores, banks, and bridges. In the *education* category were schools, colleges, and libraries. The *government* category included

courthouses, municipal buildings, post-offices, prisons, fire stations, lighthouses, and coastguard and life-saving stations. *Leisure* themed sites included theaters, clubs, and recreation centers. In the *military* category were sites such as forts and battlefields. The *religion* category included churches, chapels, and churchyards and cemeteries. Sites categorized under the *people-place* theme were mostly those listed as a house, often that of a named person. As for example the Palmer-Marsh House in Bath, Beaufort County.

Statewide, the largest group of sites by theme was those in the *people-place* category, with in total 1,151 sites (39%). The second most common theme was *economy* with 537 sites (18%). Sites categorized under *military*, *leisure* and *hospital* were each approximately 1% of all sites. Approximately 67 (2%) sites were categorized as *archaeological*. There were 16 sites (0.5%) in the *archaeology UCH* category and all were shipwrecks. (Figure 9.17).

In Coastal Plain OBX counties there were 19 *archaeological* sites listed, of which 15 (78%) were *UCH* sites. These were located in or off the coast of three OBX counties - Dare (10 sites), Carteret (3 sites) and New Hanover (2 sites) (FIGURE 9.19). There was just one *Archaeology UCH* in an IBX county. This was *CSS Neuse*, in Kinston in Lenoir County added to the Register in 2001. Statewide, of 67 *archaeological* sites approximately 45% were listed during the 1980s. Of *archaeological UCH* sites 16 (63%) were listed 2011-2015 (Figure 9.20).

New Hanover County *UCH* sites on the NRHP included USS *Peterhoff*, listed in 1975, and the Cape Fear Civil War Shipwreck District, added in 1985. This Shipwreck District, also encompasses Pender and Brunswick Counties, and includes 21 shipwreck sites. Of these 15 are Civil War Blockade Runners, including *Modern Greece* (Wilde-Ramsing and Angley 1985). An additional 37 shipwrecks and derelicts, dating from 1860 to the mid -1960s, were recorded and added as an addendum to the Wilmington Historic District in 1985 (Lawrence 1985b). The

state's first designated Shipwreck Preserve was USS *Huron* in Dare County, added to the Register in 1991. In Carteret County, state shipwreck site 31CR314 (*Queen Anne's Revenge*) was added to the Register in 2004. Shipwrecks outside state waters registered in 2013 and 2015 were nominations by NOAA under the Battlefield of the Atlantic Project. These included in 2015, World War II sites - British HMT *Bedfordshire* and German submarines (U-35, U-576, U-701, and U-85).

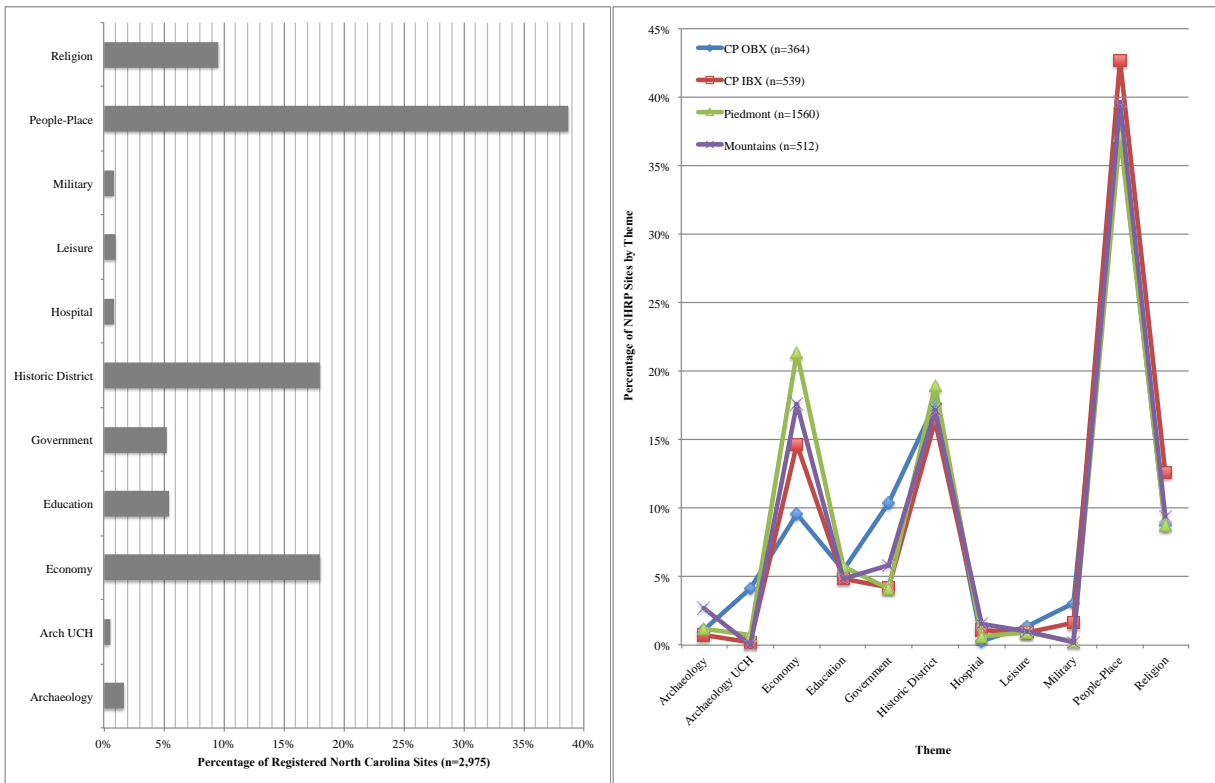


FIGURE 9.17 (left). Frequency of all North Carolina National Register Historic Places by theme as percentage of total number sites (n=2975).

FIGURE 9.18 (right). Frequency of all North Carolina National Register Historic Places in regions by theme, number of sites per theme as percentage of total number in Region. (Figures by author; data source: NC NRHP (2016)).

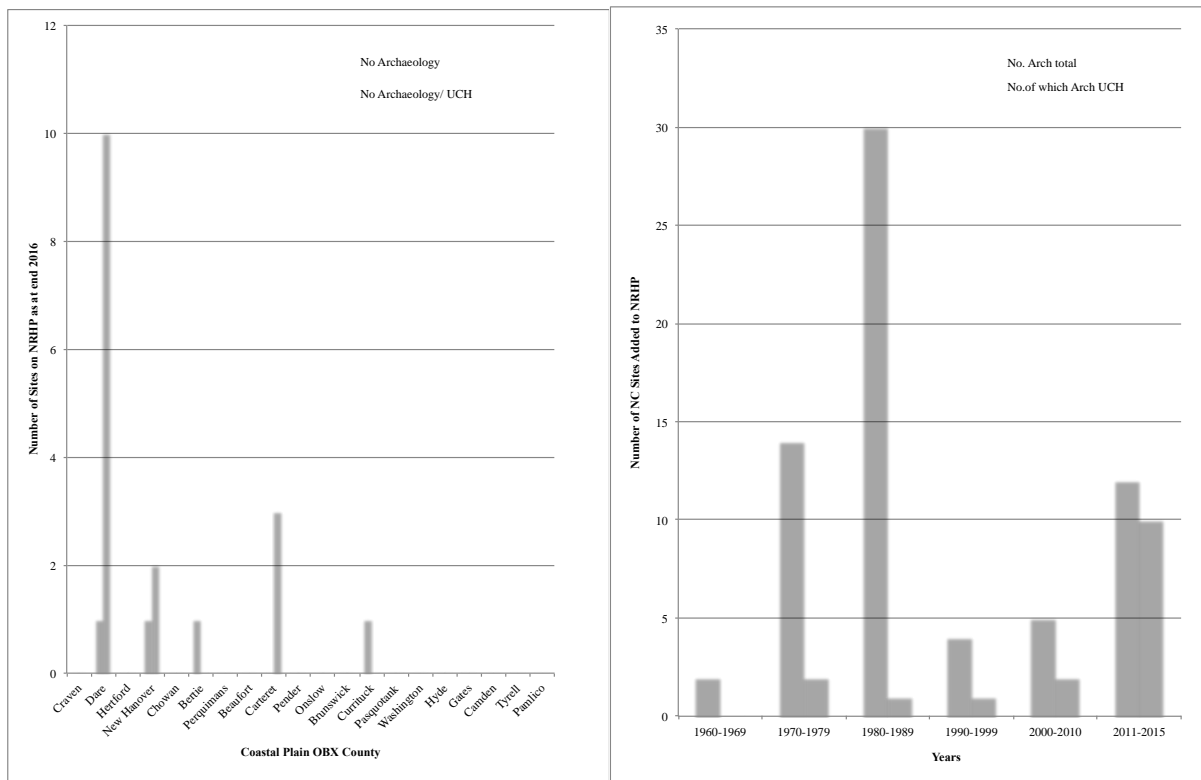


FIGURE 9.19 (left). Frequency of Archaeology and North Carolina UCH sites on National Register Historic Places by Coastal Plain OBX counties as at end 2016. (Per county: left column=archaeology; right column=Arch./UCH) FIGURE 9.20 (right). Frequency of Archaeology and North Carolina UCH sites added to National Register Historic Places per decade 1960-2015. (Figures by author, data source: NC NRHP (2016)). (Per decade: left column=archaeology; right column= Archaeology UCH).

North Carolina Underwater Sites Investigated by A&H 1960-2010

In 1963, the General Assembly provided A&H with funding to establish a Preservation Laboratory, adjacent to Fort Fisher Historic Site (NC 1963). This was to treat thousands of artifacts being recovered from the blockade-runner *Modern Greece* and other Civil War shipwrecks. The lab's first staff was a "Preservationist" appointed in 1964. In 1967, further legislation authorized A&H to employ professional underwater archaeologists (NC 1967). As no funding for staff or operations was initially available, however, it was the early 1970s before the first professional underwater archaeologist was appointed (Watts and Bright 1973; Lawrence 2011).

Over the following decades A&H's underwater archaeologists investigated and inventoried underwater sites off the coast and inland in rivers and lakes. From various archival sources, particularly newspapers, it was estimated that there were at least 5,000 historic shipwrecks off the coast since 1584 (Babits 2002:119). By 2008, the general locations of approximately 2,617 historic shipwreck sites off the coast were known, excluding those lost in battle, by fire or explosion (Lawrence 2008). The majority of these wrecks (68%) were north of Cape Lookout (Figure 6.1).

By end of 2010, information on the physical remains of almost 950 UCH sites lying within state waters, had been recorded in the NC A&H/OSA/UAB *Sites Database* (NC A&H/OSA/UAB 2011) but not all were shipwrecks off the coast. The state has jurisdiction up to three nautical miles of the shoreline into the Atlantic Ocean but state waters are also inland, defined under NC General Statute 143-212 as:

... any stream, river, brook, swamp, lake, sound, tidal estuary, bay, creek, reservoir, waterway, or other body or accumulation of water, whether surface or underground, public or private, or natural or artificial, that is contained in, flows through, or borders upon any portion of this State, including any portion of the Atlantic Ocean over which the State has jurisdiction. (1987, c. 827, s. 152A; 1989, c. 727, s. 218(103); 1989 (Reg. Sess., 1990), c. 1004, s. 19(b); 1991 (Reg. Sess., 1992), c. 1028, s. 1; 1997-443, s. 11A.119(a); 2015-241, s. 14.30(u), (v).)

Information for each UCH site in the *Sites Database* (NC A&H/OSA/UAB 2011) included: site reference number and name, date of first visit, location (body of water), and type of site. From this data the author characterized 942 UCH sites by: location (geographical and environmental), date first investigated, and theme. This was to understand area and levels of A&H's *professional interest* in UCH in North Carolina.

Geographic and Environmental Locations of NC UCH Sites Investigated 1960-2010

Of 942 UCH sites listed in the 2011 *Sites Database*, 924 (98%) were in Coastal Plain counties. Ten were in Federal waters. There were eight sites in six Piedmont region counties and none in Mountain region counties. The number of UCH sites inventoried per coastal county are shown in Figure 9.21.

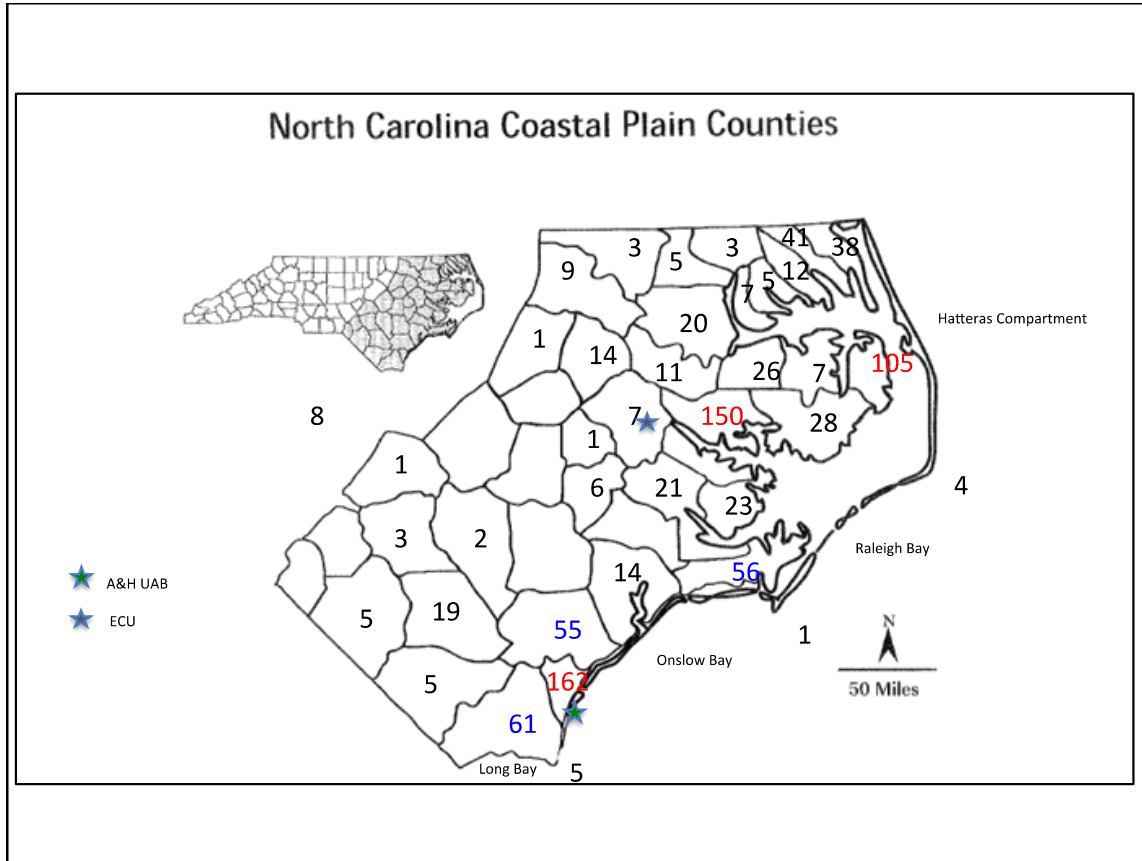


FIGURE 9.21. Numbers of UCH Sites in Coastal Plain counties first investigated 1960-2010. Also: sites in Federal waters off the coast (10 sites), in Piedmont region (8 sites), location of A&H UAB base at Fort Fisher in New Hanover County, and of East Carolina University (ECU) in Greenville, Pitt County (Figure by author, data source *Sites Database* (NC A&H/OSA/UAB 2011)). (Base map source: <https://www.ncpedia.org/geography/region/coastal-plain>).

There were 87 sites were in 14 of 21 IBX counties. Bladen County had the most sites (19), and Greene, Harnett and Nash, the least (one site each). Seven IBX counties, Duplin, Hoke, Johnston, Jones, Scotland, Wayne, and Wilson, had no sites listed. Approximately 90% (837) of all the UCH sites listed were variously in all 20 OBX counties (Figure 9.22). Three counties had

over 100 sites each: New Hanover (162), Beaufort (150), and Dare (105). The five most southern OBX counties, Brunswick, New Hanover, Pender, Onslow, and Carteret, combined had approximately 36% of all sites investigated (Figure 9.23).

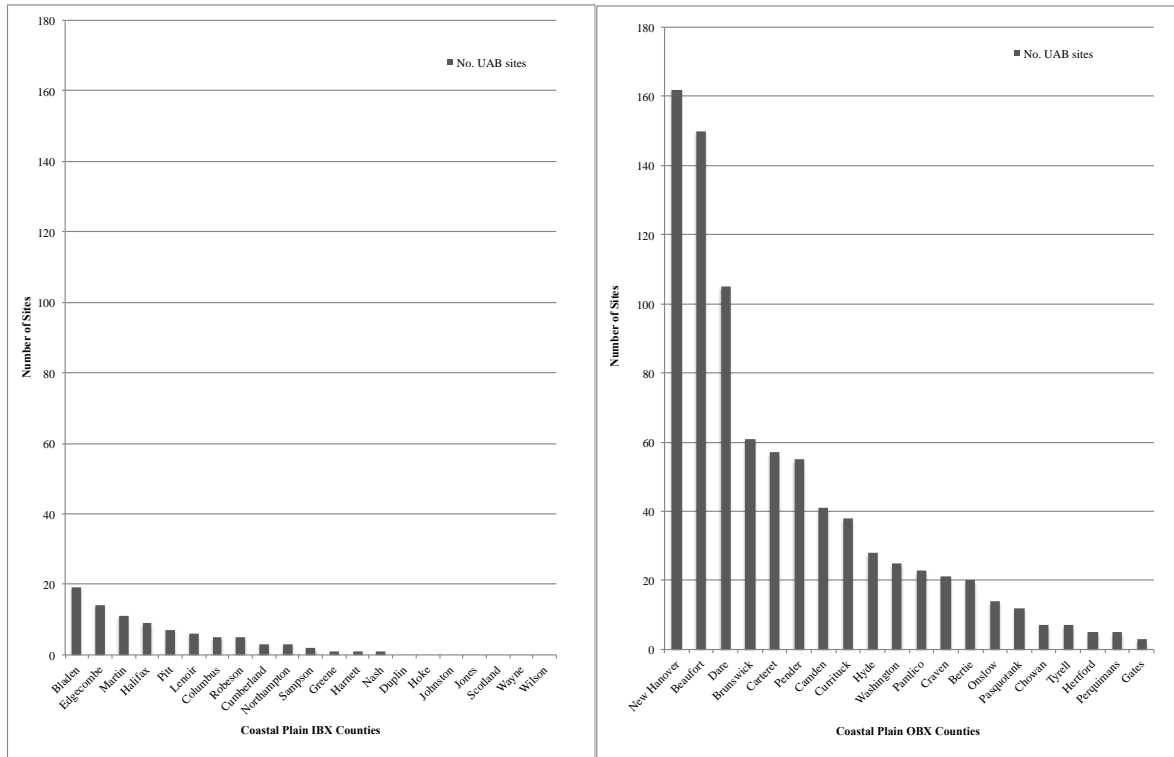


Figure 9.22 (left). Frequency of UCH sites (total 87) in Coastal Plain IBX counties (total = 21).
 Figure 9.23 (right). Frequency UCH sites (total 839) in Coastal Plain OBX counties (total = 20). (Figure by author, data source: *Sites Database* (NC A&H/OSA/UAB 2011)).

In the 2011 *Sites Database* (NC A&H/OSA/UAB 2011) sites were listed by site number that included a three-letter code for the body of water zone in which the site was found. In the *Bibliography of North Carolina Underwater Archaeology* (Brooks et al. 2009:67-70), these zoning codes are identified by type of water environment as: bay, harbor, sound, beach, canal, inlet, lake, ocean, river, creek, tributary, shoal, or wetland. UCH sites listed in the 2011 *Sites Database* were in a range of these underwater environments (Table 9.1). By this author’s analysis the majority of sites (62%) were in rivers and creeks (Figure 9.24). Rivers with most sites were: Cape Fear; NE Cape Fear, Pungo, and Pamlico, Rivers (Figure 9.25).

UAB Sites	Creek	Lake	River	Sound	Bay	Inlet	Harbor	Beach	Banks	Island	Ocean	Total
Federal											10	10
CP OBX	45	24	463	27	12	69	7	134	24	31	1	837
CP IBX	1	14	72									87
Piedmont			8									8
Total	46	38	543	27	12	69	7	134	24	31	11	942

TABLE 9.1. Frequency of UCH Sites listed in 2011 *Sites Database* by type of body of water (Table by author, data source: *Sites Database* (NC A&H/OSA/UAB 2011)).

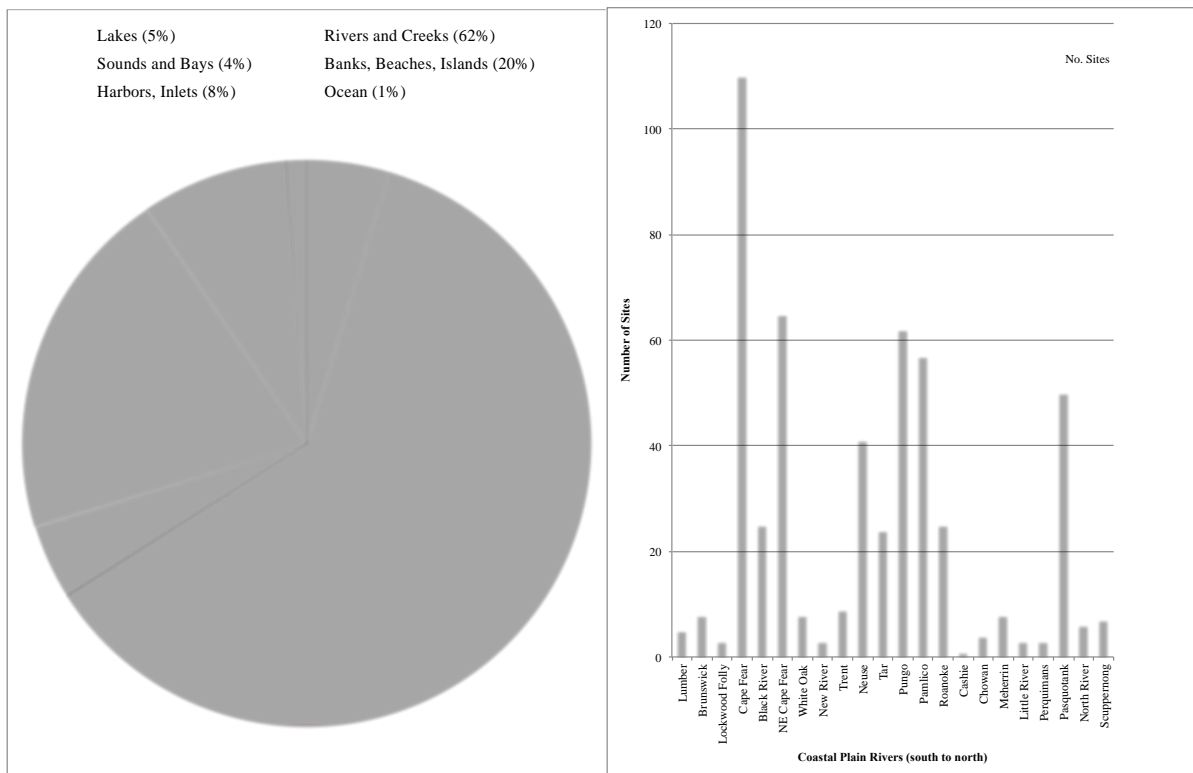


FIGURE 9.24 (left). Percentages of all UCH sites (n= 942) by type of location environment. FIGURE 9.25 (right). Frequency of river located UCH sites investigated 1960-2010 (n=543). (Figures by author, data source: *Sites Database* (NC A&H/OSA/UAB 2011)). Rivers listed as occur in the state from south to north.

By body of water zoning codes in Brooks et al. (2009: 67-70) approximately a third (278) of sites listed were in ocean side environments - banks, beaches, inlets, harbors, islands, and the ocean. Almost half (48%) of these were beach sites and approximately 25% were inlet sites. In IBX counties almost 83% of sites were river locations, and in the OBX counties approximately 55% were (Table 9.1). The most river sites were in two OBX counties - Beaufort (121) and New Hanover (118) (Figure 9.26). The Cape Fear river basin (draining the Brunswick, Cape Fear, South, Black, and North East Cape Fear Rivers) had the most sites investigated. Of 530 sites listed for these rivers, approximately 25% (110 sites) were in the Cape Fear River, and just over

60 sites in the North East Cape Fear (Figure 9.25). The Cape Fear River drains directly to the ocean through the Cape Fear Inlet into Long Bay, in Brunswick/New Hanover County.

By geologic zone, of the 278-ocean side sites most (118) were in counties north of Cape Hatteras, fronting the Hatteras Compartment. Approximately 100 sites (85%) were beach shipwreck sites. In Onslow Bay, of 104 sites, 53 (50%) were in inlets. There were 20 sites in Long Bay, of which 11 (55%) were also inlet sites. Of 25 sites in Raleigh Bay almost 90% were listed as an island location (Figure 9.27).

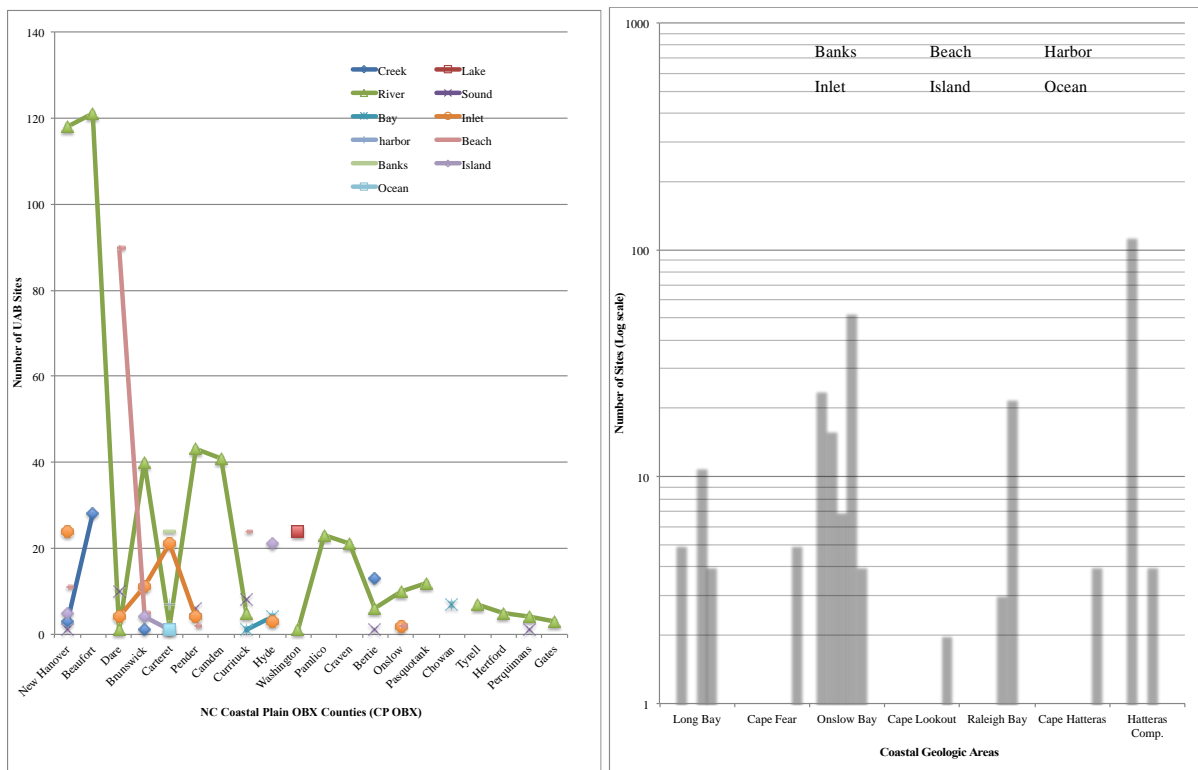


FIGURE (left) 9.26. Frequency of UCH sites listed in UAB Sites Database by body of water in Coastal Plain OBX counties.

FIGURE 9.27 (right). Frequency (log scale) of coastal and off shore sites by geologic location and type of body of water. (Figures by author, data source: Sites Database (NC A&H/OSA/UAB 2011)).

Theme of NC UCH Sites Investigated 1960-2010

From descriptions in the “Site Name” field of the 2011 *Sites Database* (NC A&H/OSA/UAB 2011) the author identified four themes by which 942 sites could be generally characterized. This was done to investigate if there might be more *professional interest* in some types of site than others as indicated by numbers of UCH sites per theme category. Theme categories were *canoe*, *economy*, *military*, and *place*. Sites listed in the database as *canoe* were characterized as such. Sites characterized under the *economy* theme were those listed as barges, tugs, or other non-military vessels. *Military* themed sites included named USS or CSS vessels, Civil War Blockade runners, and places such as forts. *Place* themed sites included non-military sites such as those described as waterfronts, landings, bridges, ferries, warehouse, and artifact find sites (for example of bottles, olive jars, rudders).

Most sites were in the *economy* group (602, 64%). There were 227 (24%) sites in the *place* group and 68 (7%) were *canoos*. The smallest group was the *military* one with 45 sites (5%) (Table 9.2).

UAB Sites	Canoes	Economy	Military	Place	Total
Federal	0	4	6	0	10
CP OBX	35	568	35	199	837
CP IBX	30	28	4	25	87
Piedmont	3	2	0	3	8
Total	68	602	45	227	942

TABLE 9.2. Frequency of UCH Sites in North Carolina by region and by theme of site (Table by author, data source: *Sites Database* (NC A&H/OSA/UAB 2011)).

By region the majority of all UCH sites investigated (88%) were in OBX counties. The majority (55%) of sites in the *economy* group were in three OBX counties: Beaufort (134), New Hanover (114), and Dare (67). Of 227 UCH sites with a *place* theme 199 sites (87%) were in OBX counties. The two counties with the largest number of *place* themed sites were Dare (36 sites) and New Hanover (29 sites). There were 35 sites in OBX counties categorized with a

military theme. Of these 15 (42%) were in New Hanover County and 10 (28%) were in Brunswick County (Table 9.2; Figure 9.28).

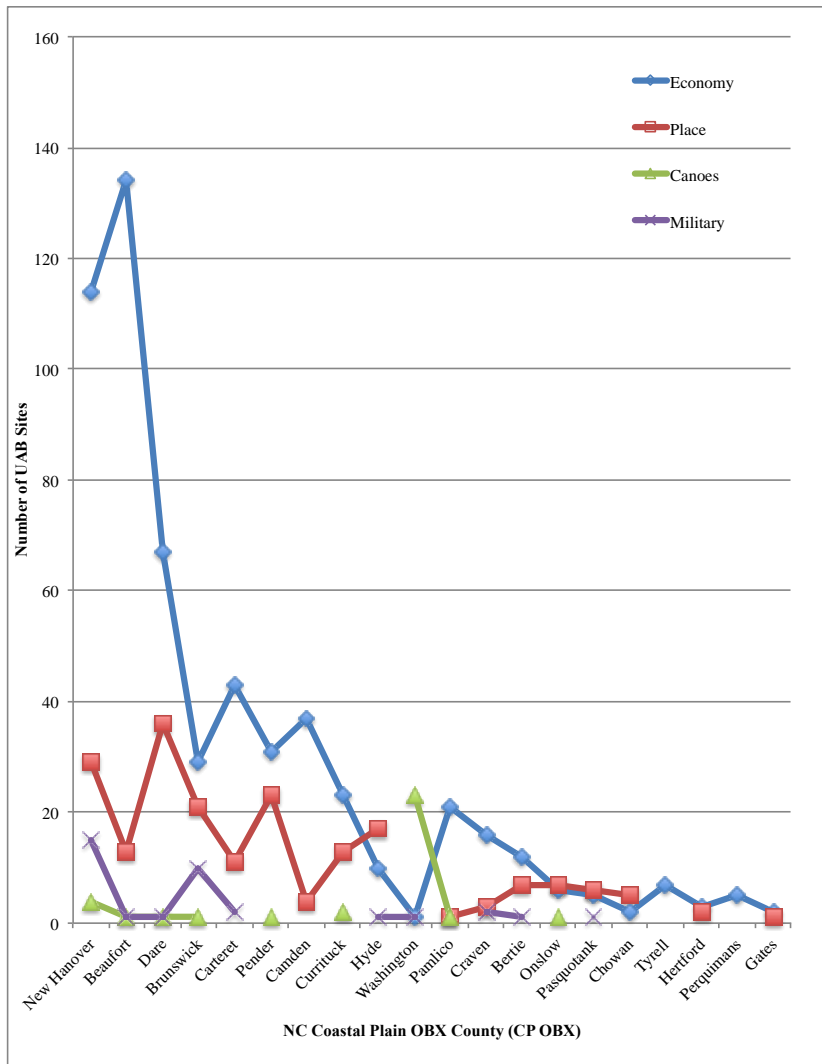


FIGURE 9.28. Frequency of UCH sites by theme category in Coastal Plain OBX counties categorized by theme (Figure by author, data source: *Sites Database* (NC A&H/OSA/UAB 2011)).

By location, in New Hanover County and Brunswick County the majority of all sites were river sites. In New Hanover County of a total of 162 sites, 118 (72%) were river sites. Of a total of 149 sites in Beaufort County, 121 (81%) were river sites. In Dare County, of a total of 105 sites, 90 (85%) were beach wrecks. Of 68 canoes listed in all regions, almost 60% were found in lakes and 33% in rivers.

Of all 68 sites in the *canoe* category, three were found in Piedmont counties: Franklin (1), Moore (1), and Wake (1). All were in rivers: Tar, Cape Fear, and Neuse, respectively. The majority of canoes listed were found in lakes and rivers in the Coastal Plain. Thirty canoes were found in six IBX counties: Bladen (13), Columbus (4), Cumberland (2), Edgecombe (6), Nash (1), and Robeson (4). Sixteen were found in lakes: Black Lake (3), Jones Lake (1), White Lake (8), and Lake Waccamaw (4). Six canoes were found in the Tar River in Edgecombe County, and four in the Lumber River in Robeson County. Of all canoe sites just over half (35 canoes) were found in nine OBX counties. Six were river finds, variously in the Pamlico, Cape Fear, New, and Neuse, Rivers. Three were found in sounds and one in an inlet. The most canoes found in one location were in Lake Phelps in Washington County, of which 22 were first investigated in 1985-1986.

Professional Interest: Six UCH Sites and Associated State Attractions (ASAs)

For relative *professional interest* in the six UCH case study sites and ASAs data was collected for two interest indicators: numbers of publications by keyword searches of *Google Scholar* online database, and numbers of references listed per site in the 2016 *Bibliography of Underwater Sites* (NC A&H/OSA/UAB 2016) for 1960-2017 (Table 9.3).

UCH Sites	No. Publications (Google Scholar 2018.04.07)	% of Total	No. References by ID# (UAB 2016)	% of Total
<i>Modern Greece</i> (MG)	38	8%	5	2%
CSS <i>Neuse</i> (CSSN)	67	14%	4	2%
Lake Phelps Canoes (LPC)	23	5%	57	28%
USS <i>Huron</i> (USSH)	45	10%	6	3%
<i>Queen Anne's Revenge</i> (QAR)	250	53%	129	64%
Corolla ad Shipwrecks (GBW)	46	10%	1	0%
Total	469	100%	202	100%
Associated State Attractions				
Fort Fisher (MG)	39	9%	0	0
CSS <i>Neuse</i> (CSSN)	10	2%	0	0
Pettigrew SP (LPC)	85	19%	0	0
Jockey's Ridge SP (USSH)	50	11%	0	0
NC Maritime Museum Beaufort (QAR)	233	52%	0	0
Graveyard of Atlantic Museum (GBW)	27	6%	0	0
Total	444	100%	0	0

TABLE 9.3. Numbers of publications found on keyword searches for six UCH sites and six ASAs in *Google Scholar* 1960/1961-2016/2017 (57 years). (Table by author, data source: *Google Scholar* 2018.04.08; NC A&H/OSA/UAB 2016).

Professional Interest: Six UCH Sites and Six ASAs: Google Scholar: 1960-2017: Totals

By keyword searches of *Google Scholar*, a total of 469 relevant matches for the six UCH sites were found (Table 9.3). Of which for: *Modern Greece* 38 (8%), *CSS Neuse* 67 (14%), Lake Phelps and canoes 23 (5%), *USS Huron* 45 (10%), and *Queen Anne's Revenge* 250 (53%). The name "George Browne" Wreck as an assigned A&H/OSA/UAB name for this beach wreck did not appear in *Google Scholar*. To gauge *professional interest* in beach wrecks generally along Corolla Beach, therefore, the keyword search was made on "Corolla" and "shipwrecks", for which 46 (10%) matches were found.

Over 57 years from 1960 to 2017 the average number of publications per year for each UCH site was for: *Modern Greece* 0.66, *CSS Neuse* 1.17, Lake Phelps canoes 0.4, *USS Huron* 0.78, *Queen Anne's Revenge* 4.38, and for Corolla shipwrecks generally 0.80. Assuming the number of publications in *Google Scholar* is an indication of *professional interest* in a site, on the basis of calculated average number of publications per year there was most *professional interest* in *Queen Anne's Revenge* (4.38 per year) and least in Lake Phelps canoes (0.4 per year).

A total of 444 relevant publications on keyword searches for the ASAs were found (Table 9.3): Fort Fisher Historic Site 39 (9%), *CSS Neuse* Historic Site 10 (2%), Pettigrew State Park 85 (19%), Jockey's Ridge State Park 50 (11%), North Carolina Maritime Museum 233 (52%), Graveyard of the Atlantic Museum 27 (6%). The average number of publications per year for each ASA as calculated for the number of years each had been under NC agency management (DCR or DENR) was for: Fort Fisher Historic Site 0.68 per year (over 57 years), *CSS Neuse* Historic Site 0.19 per year (over 51 years), Pettigrew State Park 1.49 per year (over 57 years), Jockey's Ridge State Park 0.87 (over 42 years), NC Maritime Museum 11.65 (over 33 years), and Graveyard of the Atlantic Museum 1.8 (over 15 years). By average number of publications

per year in *Google Scholar* as a measure of *professional interest* there was most interest in the NC Maritime Museum (11.65 publications per year) and least in CSS *Neuse* Historic Site (0.19 publications per year).

Professional Interest: Six UCH Sites and Six ASAs: References in UAB Bibliography:

1960-2017: Totals

In A&H's 2016 *Bibliography of Underwater Archaeology* (NC A&H/OSA/UAB 2016) a total of 202 references were identified for the six UCH sites: *Modern Greece* 5 (2%); CSS *Neuse* 4 (2%); Lake Phelps and canoes 57 (28%); USS *Huron* 6 (3%); *Queen Anne's Revenge* 129 (64%); and for the "George Browne" Wreck one (less than 1%). There were no references to the ASAs (Table 9.3).

The average number of references per year for each of the six UCH sites was calculated for the number of years each had been under A&H management - from the date the site was first listed in the 2011 *Sites Database* (NC A&H/OSA/UAB 2011) to 2016/2017. The average number references per year was for: *Modern Greece* 0.09 (over 55 years), CSS *Neuse* 0.07 (over 54 years), for Lake Phelps canoes 1.78 (over 32 years), USS *Huron* 0.20 (over 31 years), *Queen Anne's Revenge* 6.1 (over 21 years), and for the "George Browne" Wreck 0.1 (over 10 years). Thus, by average number of references per year in the 2016 *Bibliography* there was most *professional interest* in *Queen Anne's Revenge* and least in CSS *Neuse*.

Summary

This chapter described results of the author's investigation of *professional interest* in North Carolina history, UCH in general, and six UCH case study sites in particular since the 1960s. The first part of the chapter described professional activities of A&H as a public organization. The second part of the chapter described and quantified levels of activity in three

A&H managed programs generally: the *North Carolina Highway Historical Marker Program* (NC HHM), North Carolina listings on the *National Register of Historic Places* (NC NRHP), and UCH sites investigated by A&H since the early 1960s, as listed in the 2011 Sites Database (NC A&H/OSA/UAB 2011). Indicator data collected for levels of *professional interest* in the six UCH case study sites and ASAs were numbers of publications found by keyword searches of *Google Scholar* online database and numbers of references listed in the 2016 *Bibliography of Underwater Sites* (NC A&H/OSA/UAB 2016).

Of 1,580 *Highway Historical Markers* 43% were in Coastal Plain counties, with 23% in OBX counties. Most of which were in New Hanover County (63). One hundred and fourteen (7.4%) of all markers had a *maritime* theme of which 73% were in OBX counties. Most *maritime* markers were in Dare County (13) and New Hanover County (12). Fifty percent of all *maritime* markers were *military*, with 65% relating to the Civil War. Ninety-three percent of *military* theme markers were in Coastal Plain counties with most in New Hanover County and Dare County

By end of 2016 there were 2,975 North Carolina sites listed on the *National Register of Historic Places* (NC NRHP). Thirty percent were in Coastal Plain counties, of which 60% were in IBX counties. Most NRHP sites were in Cumberland County (73). In OBX counties, Craven County had the most sites. By theme most sites were *people-place* (39%). One percent had an *archaeological* theme and 0.5% were in the *archaeological UCH* group. In OBX counties of 19 archaeological sites 78% were UCH sites in Dare (10), Carteret (3), and New Hanover (2 sites) Counties. This counting the Cape Fear Civil War Shipwreck District as one listing. In Dare County, USS *Huron* was listed in 1991. In Carteret County state shipwreck site 31CR314,

(*Queen Anne's Revenge*) was listed in 2004. There was just one *archaeological UCH* site listed in an IBX county - CSS *Neuse* in Kinston, Lenoir County.

By 2010, approximately 950 UCH sites in state waters off the coast and inland had been visited and inventoried in the 2011 *Sites Database* (NC A&H/OSA/UAB 2011) since the early 1960s. Ninety percent were in OBX counties with 30% in New Hanover, Brunswick, and Pender Counties. By body of water 62% of sites were in rivers and creeks with most in the Cape Fear, NE Cape Fear, Pungo, and Pamlico Rivers. One third of UCH sites were ocean side environments. By theme most (64%) were in the *economy* group and least (5%) in the *military*. Most *economy*, *place*, and *military* sites were in New Hanover, Dare, Brunswick, and Beaufort Counties. Of 68 *canoes* more than 20 were in Lake Phelps, Washington County.

By number of publications in *Google Scholar* for the six UCH case study sites there was most *professional interest* was in *Queen Anne's Revenge* and least in Lake Phelps canoes. For ASAs there was most interest in the NC Maritime Museum and least in CSS *Neuse* Historic Site. By number of references in the 2016 *Bibliography* (NC A&H/OSA/UAB 2016) there was most interest in *Queen Anne's Revenge* and least interest in CSS *Neuse*.

This chapter, and the two previous chapters (7 and 8) described and analyzed by period totals indicator data collected by the author for *public*, *political*, and *professional* interests in history, UCH in general and six UCH sites in particular in North Carolina. In the next chapter this data is further analyzed from the perspective of three public policy models to identify the nature and behavior of the system (as *traditional* or *complex*) within which conservation of UCH sites has been managed in North Carolina, and to understand how interests changed over time, correlate with each other, and with conservation actions.

CHAPTER 10

ANALYSES AND MODELS

“...diagnosis lies at the heart of effective management...
to do this we need understanding, or theories, of the way variables affect each other”
(Handy 1985:18).

Introduction

The fourth research question (RQ4) for this study asked what is the nature and behavior of A&H as a public agency organization in general, and of the six UCH case study projects in particular from a systems perspective, were they *traditional* or *complex* systems? For much of the 20th century public management systems were *traditionally* assumed to be stable, ordered, and predictable, with linear relationships between cause and effect for implementing public policy (Geyer and Rihani 2010:5). Since the 1990s, however, researchers have found them instead often to be behaving as *complex* systems - unstable, dynamic, unpredictable, and non-linear. For effective implementation of public policy different management approaches may be needed depending on whether the nature and behaviour of a particular public organization or project as a system is *traditional* or *complex* (Geyer and Rihani 2010; Cairney 2012; Byrne and Callaghan 2014).

This chapter describes results of the author’s analyses of data collected by the author on *conservation actions* and levels of *players’ interests* in North Carolina history and remains of its past, in UCH in general, and six UCH sites and six ASAs in particular. This data was analyzed from the perspective of the perspectives of three public policy models: a *Cyclical Public Policy Process Model* (Kraft and Furlong 2007:71-72), a *Dynamic Systems Model* (Dooley and Van de Ven 1999; Haynes 2008), and a *Complex Adaptive System (CAS)* model (Rhodes et al. (2011).

Cyclical Public Policy Process Model

The *Cyclical Public Policy Process (CPPP)* model of Kraft and Furlong (2007:71-72) proposes a relationship between players (public, political and professional) as agents in public management systems. It assumes a *traditional* management system with a predictable sequence of events and actions in the formulation, implementation, and evaluation of public policy (Figure 10.1). If there is sufficient *public interest* in an identified problem it gets onto government's policy agenda. With sufficient *political interest* legislation is enacted, policy formed, and resources provided. Public agencies are then tasked with taking actions to implement legislation and public policy. In the case of UCH *conservation actions* taken may then depend on levels of *professional interest*.

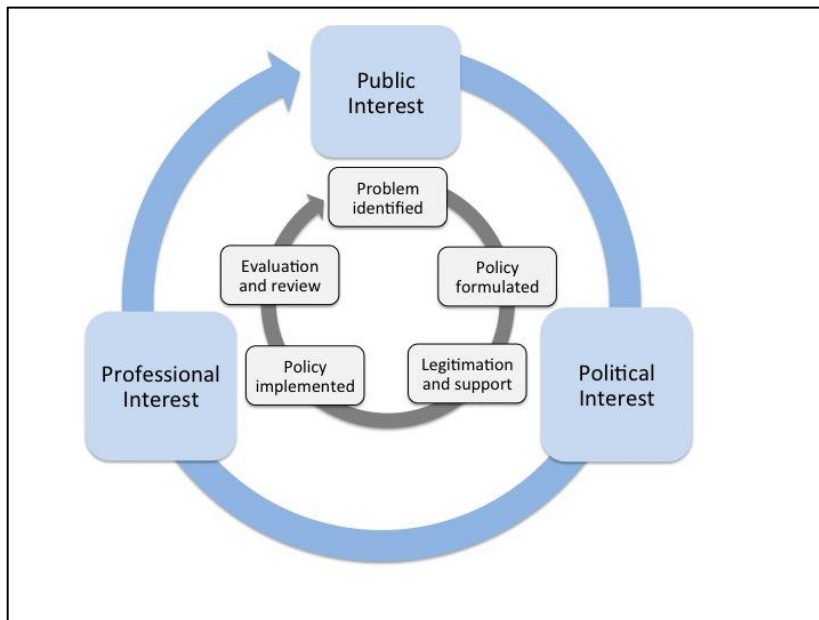


FIGURE 10.1. Cyclical Public Policy Process (CPPP) Model. (Figure by author, after Kraft and Furlong 2007).

The *null hypothesis* (H_0) as tested from the perspective of this CPPP model was that there is no correlation between levels of *players' (public, political and professional) interests*, or between them and *conservation actions* for either the six UCH sites or ASAs. This was tested for 21 paired sets of rank ordered sets of indicators for levels of *players' interest*, and between levels

of *interest* and *conservation actions* (Table 10.1). To identify and provide measures of strength and significance, *Spearman Rank Correlation Coefficients* (r_s) between rank ordered paired sets of indicators were calculated (Stephens 2004:215; Hauke and Kossowski 2011:89).

r_s	Interest:	Public		Political		Professional		
Interest	Indicators	Public Reading	Public Visiting	Legislation	NR\$	Publications	Refs UAB Biblio	Cons Actions
Public	Public Reading		H1 _o (1)	H1 _o (2)	H1 _o (3)	H1 _o (4)	H1 _o (5)	H2 _o (1)
	Public Visiting	H1 _o (1)		H1 _o (6)	H1 _o (7)	H1 _o (8)	H1 _o (9)	H2 _o (2)
Political	Legislation	H1 _o (2)	H1 _o (6)		H1 _o (10)	H1 _o (11)	H1 _o (12)	H2 _o (3)
	NR\$	H1 _o (3)	H1 _o (7)	H1 _o (10)		H1 _o (13)	H1 _o (14)	H2 _o (4)
Professional	Publications	H1 _o (4)	H1 _o (8)	H1 _o (11)	H1 _o (13)		H1 _o (15)	H2 _o (5)
	Refs UAB Biblio	H1 _o (5)	H1 _o (9)	H1 _o (12)	H1 _o (14)	H1 _o (15)		H2 _o (6)
Cons Actions	Cons Actions	H2 _o (1)	H2 _o (2)	H2 _o (3)	H2 _o (4)	H2 _o (5)	H2 _o (6)	

TABLE 10.1. Null Hypotheses: no correlation between levels of interest as rank ordered for sets of indicators for levels of interest and between levels of interest and conservation actions. (Table by author).

Rank Ordering of Interest Indicator Values and of Conservation Actions

The six UCH sites were rank ordered by *conservation actions* (as were described in Chapter 6). For each site a “conservation rank number” was calculated by summing *conservation actions* taken. For example, for *Queen Anne’s Revenge* the conservation rank number calculated was 15 (C1+C2+C3+C4+C5 = 15). By conservation rank number sites were rank ordered (RO) (1=lowest and 6=highest) as follows: “George Browne” Wreck (RO=1), *USS Huron* (RO=2), *CSS Neuse* (RO=3), *Modern Greece* (RO=4), *Lake Phelps*” and “canoes” (RO=5), and *Queen Anne’s Revenge* (RO=6), as summarized in Table 10.2. Rank order values (RO) also were assigned to indicators of levels of *players’ interests*, for 1960-2017 totals, for each UCH site and ASA. RO values being based on the calculated average per year for each set of indicator values (Tables 10.3, Table 10.4).

Where values were tied the average of the next rank-order values was assigned (Stephens 2004:215; Drennan 2010:225). For example, for *public interest* the highest-level interest indicator by average number articles per year in ANHC (2018), was for *Queen Anne's Revenge* (20.1 per year) - for which RO=6. The next highest (8.5 per year) was *CSS Neuse* - RO=5, and *Modern Greece* (1.3 per year) was assigned RO= 4. Interest indicator values (averages per year) were the same for Lake Phelps canoes and Corolla Shipwrecks (0.6 per year). Therefore, for both Lake Phelps Canoes and Corolla Shipwrecks the RO value was the average of $3+2=5/2 = 2.5$. Least interest was in *USS Huron* (0.4 per year) - RO =1 (Table 10.3). RO values thus calculated for *players' interests* and for *conservation actions* for each of the six UCH sites and ASAs are shown in Table 10.4.

Conservation Options:		No Action	Preserve by Record	Preserve In Situ (Passive)	Preserve In Situ (Active)	Recovery & Reburial	Preserve Ex Situ		
UCH Site	Year	C0	C1	C2	C3	C4	C5	C Rank #	C Rank Order
"George Brown" Wreck	2008-2017		★					1	1
USS <i>Huron</i>	1987-2017		★	★				3	2
CSS <i>Neuse</i>	1962-2017		★				★	6	3
<i>Modern Greece</i>	1962-2017			★		★	★	11	4
Lake Phelps Canoes	1986-2017		★	★		★	★	12	5
<i>Queen Anne's Revenge</i>	1997-2017		★	★	★	★	★	15	6

TABLE 10.2. Conservation actions, conservation rank number, and conservation rank order for six UCH Sites in North Carolina 1960-2017. (Table by author, data sources: as in Chapter 9).

Players's Interest Indicators for period 1960/1961-2016/2017 (financial years)	Date Range: established or known 1960-2016	No. Years established 1960-2016	Public: Reading	Date Range under A&H management	No. Years under A&H management 1960-2016	Public: Visiting	Political: Legislation	Political: Appropriation	Political: Appropriation	Professional:	Professional:
UCH Sites	Date Range:	No. Years	Av. No. Articles	Date Range	No. Years	Av. No. Visitors	Av. No. NC Session Laws	Av. R\$	Av. NR\$	Av. No. GS articles over 57 years	Av. No. UAB 2016 refs
<i>Modern Greece</i>	1960-2016	57	1.3	1962-2016	55	0	0.05	\$1,454	\$909	0.66	0.09
CSS <i>Neuse</i>	1960-2016	57	8.5	1963-2016	54	0	0.15	\$297,000	\$75,000	1.17	0.07
Lake Phelps Canoes	1985-2016	32	0.6	1985-2016	32	0	0	0	0	0.4	1.78
USS <i>Huron</i> *	1960-2016	57	0.4	1986-2016	31	300	0	0	0	0.78	0.2
<i>Queen Anne's Revenge</i>	1960-2016	57	20.1	1996-2016	21	0	0.7	\$214,000	\$161,900	4.38	6.1
Corolla and Shipwrecks (George Brown Wreck)	1960-2016	57	0.6	2007-2016	10	0	0	0	0	0.8	0.1
ASAs											
Fort Fisher Historic Site	1960-2016	57	16.2	1955-2016	57	273,684	0.15	328,000	\$250,877	0.68	0
CSS <i>Neuse</i> Historic Site	1964-2014	51	2.3	1964-2016	51	16,470	0.15	319,600	\$78,431	0.19	0
Pettigrew State Park	1960-2016	57	4.2	1960-2016	57	142,728	0.18	324,560	\$52,631	1.49	0
Jockey's Ridge State Park	1975-2016	42	12.4	1975-2016	42	3,220,000	0.09	452,000	\$17,857	0.87	0
NC Maritime Museum	1984-2016	33	8.3	1997-2016	20	235,000	0.42	1,350,000	\$110,294	11.65	0
Graveyard of the Atlantic Museum	2002-2016	15	13	2002-2016	15	32,000	0.26	233,333	\$180,000	1.8	0

TABLE 10.3. Indicators for players' interest in six UCH sites and ASAs 1960/1961 to 2016/2017, as averages per year. (Table by author, data sources: A&H Biennial Reports (NC A&H 1960-2016); ANHC (2018); NC Session Laws; *Google Scholar*, 2016 Bibliography (NC A&H/OSA/UAB 2016)).

Players's Interest Indicators for period 1960/1961-2016/2017 (financial years)	Public: Reading	Public: Visiting	Political: Legislation	Political: Appropriation	Political: Appropriation	Professional: Google Scholar	Professional: UAB 2016 Bibliography	Conservation Action
UCH Sites	RO Av. No. Articles/yr	RO Av. No. Visitors/yr.	RO Av. No. NC Session Laws/yr	RO Av. R\$/yr.	RO Av. NRS/yr.	RO Av. No./yr.	RO Av. No./yr.	RO Conservation Action
Modern Greece	4	3	4	4	4	2	2	4
CSS Neuse	5	3	5	6	5	5	1	3
Lake Phelps Canoes	2.5	3	2	2	2	1	5	5
USS Huron*	1	6	2	2	2	3	4	2
Queen Anne's Revenge	6	3	6	5	6	6	6	6
Corolla and Shipwrecks (George Brown Wreck)	2.5	3	2	2	2	4	3	1
ASAs	RO Av. No. Articles/yr	RO Av. No. Visitors/yr.	RO Av. No. NC Session Laws/yr	RO Av. R\$/yr.	RO Av. NRS/yr.	RO Av. No./yr.	RO Av. No./yr.	RO Conservation Action
Fort Fisher Historic Site	6	5	2.5	4	6	2	3.5	4
CSS Neuse Historic Site	1	1	2.5	2	3	1	3.5	3
Pettigrew State Park	2	3	4	3	2	4	3.5	5
Jockey's Ridge State Park	4	6	1	5	1	3	3.5	2
NC Maritime Museum	3	4	6	6	4	6	3.5	6
Graveyard of the Atlantic Museum	5	2	5	1	5	5	3.5	1

TABLE 10.4. Rank order (RO) indicator values for players interests (averages per year) and RO for conservation actions. (Table by author, data sources - see Table 10.3).

By the CPPP model correlation between cause and effect between levels of *players' interest* and between them and *conservation actions* is predicted. For example, if RO value for *public interest* is high, then high RO values for *political interest*, *professional interest* and of *conservation action* is expected. To see if this followed for the six UCH sites and ASAs, the RO values calculated as above were plotted, as in Figure 10.2 and Figure 10.3 respectively. From which it can be seen that no UCH site nor ASA has the same RO value for all *interest* indicators, and *conservation actions*. To identify and provide measures of strength and significance for any correlations there might be between rank ordered paired sets of indicators for UCH sites and ASAs, *Spearman Rank Correlation Coefficients* (r_s) were calculated (Stephens 2004:215; Hauke and Kossowski 2011:89).

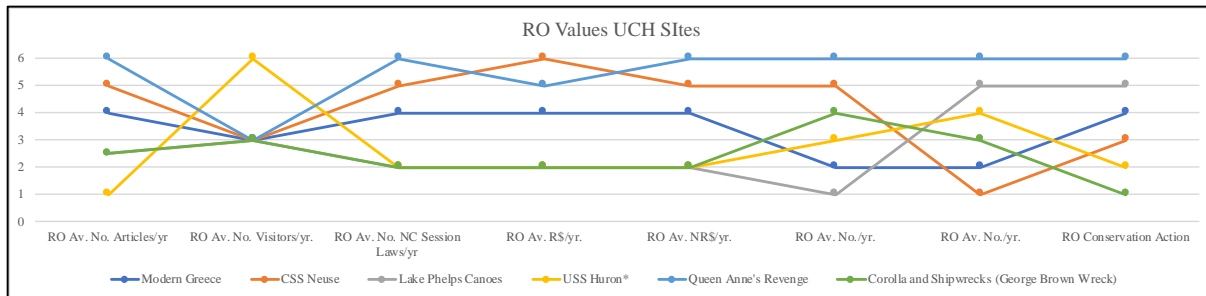


FIGURE 10.2. Rank order (RO) values for interest indicator values for six UCH sites for average values per year for period FY1960/1961-2016/2017. (Figure by author, data source: Table 10.4).

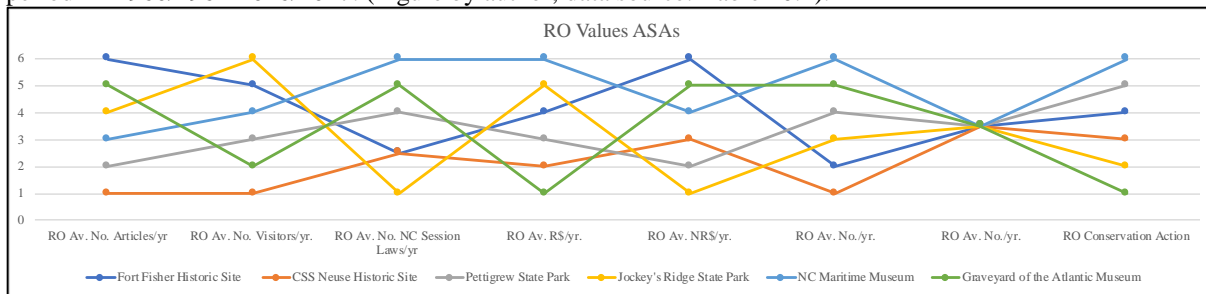


FIGURE 10.3. Rank order (RO) values for interest indicator values for six ASAs for average values per year for period FY1960/1961-2016/2017. (Figure by author, data source: Table 10.4).

Calculations of Spearman Rank Correlation Coefficients (r_s)

Spearman Rank Correlation Coefficients (r_s) were calculated by the author in Excel using the CORREL function (Stephens 2004:215) for 21 paired sets of rank ordered indicators for the six UCH sites (Table 10.5) and for 15 paired sets of indicators for ASAs (Table 10.6). As no references were found for ASAs in the 2016 *Bibliography* (NC A&H/OA/UAB 2016) this indicator was not included in the calculations for ASAs.

r_s	Interest:	Public		Political		Professional		
Interest	Indicators	Reading	Visiting	Legislation	NRS	Publications: Google Scholar	Refs. UAB Biblio	Cons Actions
Public	Reading	1	-0.66	0.95	0.95	0.64	-0.03	0.61
	Visiting	-0.66	1	-0.42	-0.42	-0.13	0.13	-0.39
Political	Legislation	0.95	-0.42	1	1	0.7	-0.03	0.58
	NRS	0.95	-0.42	1	1	0.7	-0.03	0.58
Professional	Publications	0.64	-0.13	0.71	0.7	1	0.03	0.03
	Refs UAB Biblio	-0.12	0.13	-0.03	-0.03	0.03	1	0.54
Cons Actions	Cons Actions	0.61	-0.39	0.58	0.58	0.03	0.54	1

TABLE 10.5. Spearman rank correlation coefficients (r_s) calculated for pairs of rank ordered sets of indicators for levels of interest and between levels of interest and conservation actions for six UCH Sites. (Table by author).

r_s	Interest:	Public		Political		Professional	
Interest	Indicators	Reading	Visiting	Legislation	NR\$	Publications: GS	Cons Actions
Public	Reading	1	1.00	-0.06	0.60	0.14	-0.31
	Visiting	1.00	1	-0.38	-0.14	0.09	0.14
Political	Legislation	-0.06	-0.38	1	0.41	0.81	0.41
	NR\$	0.60	-0.14	0.41	1	0.09	0.03
Professional	Publications: GS	0.14	0.09	0.81	0.09	1	0.26
Cons Actions	Cons Actions	-0.31	0.14	0.41	0.03	0.26	1

TABLE 10.6. Spearman rank correlation coefficient (r_s) calculated for pairs of rank ordered sets of interest indicators, between levels of interest and conservation actions for six ASAs. (Table by author).

Spearman's correlation coefficient (r_s) as a statistical measure of the strength of relationship (monotonic) between each paired set of data is constrained as: $-1 \leq r_s \leq 1$. The closer r_s is to ± 1 the "stronger" the relationship. Thus, by ranges of r_s values the strength of correlations can be verbally described (Stephens 2004:215; Hauke and Kossowski 2011:89; www.statstutor.ac.uk):

- "Very weak" (VW): r_s 0.00-0.19
- "Weak" (W): r_s 0.20-0.39
- "Moderate" (M): r_s 0.40-0.59
- "Strong" (S): r_s 0.60-0.79
- "Very Strong" (VS): r_s 0.80-1.00.

These verbal descriptions for strength of correlations between paired sets of rank order indicator values were substituted for r_s calculated for the six UCH sites (Table 10.7) and for the ASAs (Table 10.8).

r_s	Interest:	Public		Political		Professional		
Interest	Indicators	Reading	Visiting	Legislation	NR\$	Publications	Refs UAB Biblio	Cons Actions
Public	Reading	1	S	VS	VS	S	VW	S
	Visiting	S	1	M	M	VW	VW	W
Political	Legislation	VS	M	1	VS	S	VW	M
	NR\$	VS	M	VS	1	S	VW	M
Professional	Publications	S	VW	S	S	1	VW	VW
	Refs UAB Biblio	VW	VW	VW	VW	VW	1	M
Cons Actions	Cons Actions	S	W	M	M	VW	M	1

TABLE 10.7. Descriptions of strengths of Spearman's correlation coefficient (r_s) calculated for six UCH sites. (Data Table by author, data source: Table 10.5).

r_s	Interest:	Public		Political		Professional	
Interest	Indicators	Reading	Visiting	Legislation	NR\$	Publications	Cons Actions
Public	Reading	1	VS	VW	S	VW	W
	Visiting	VS	1	W	VW	VW	VW
Political	Legislation	VW	W	1	M	VS	M
	NR\$	S	VW	M	1	VW	VW
Professional	Publications	VW	VW	VS	VW	1	W
Cons Actions	Cons Actions	W	VW	M	VW	W	1

TABLE 10.8. Descriptions of strengths of Spearman's correlation coefficient (r_s) calculated for six ASAs. (Table by author, data source: Table 10.6).

To test significance of “verbal” descriptions for relationship strength between indicators sets critical p values (Table 10.9) for r_s values were found in published tables (Zar 1984). By this p values for r_s values for UCH sites (Table 10.10) and for ASAs (Table 10.11) were assigned.

		70%	80%	90%	95%	98%	100%
α (2)	p	0.50	0.20	0.10	0.05	0.02	0.01
α (1)	p	0.25	0.10	0.05	0.025	0.01	0.005
n=6		0.371	0.657	0.829	0.886	0.943	1.000

TABLE 10.9. Critical values of Spearman's ranked correlation coefficient (r_s). (Table by author, data source: Zar 1984 Table B.19).

r_s	Interest:	Public		Political		Professional		Conservation
Interest	Indicators	Reading	Visiting	Legislation	NR\$	Publications : GS	Refs. UAB Biblio	Cons Actions
Public	Reading	1	-0.66	0.95	0.95	0.64	-0.03	0.61
	Visiting	-0.66	1	-0.42	-0.42	-0.13	0.13	-0.39
Political	Legislation	0.95	-0.42	1	1.00	0.70	-0.03	0.58
	NR\$	0.95	-0.42	1.00	1	0.70	-0.03	0.58
Professional	Publications GS	0.64	-0.13	0.71	0.70	1.00	0.03	0.03
	Refs UAB Biblio	-0.12	0.13	-0.03	-0.03	0.03	1	0.54
Cons Actions	Cons Actions	0.61	-0.39	0.58	0.58	0.03	0.54	1

TABLE 10.10. Critical values (p) of Spearman's ranked correlation coefficient (r_s) for six UCH sites. (Table by author, data sources: Table 10.5).

r_s	Interest:	Public		Political		Professional	
Interest	Indicators	Reading	Visiting	Legislation	NR\$	Publications: GS	Cons Actions
Public	Reading	1	1.00	-0.06	0.60	0.14	-0.31
	Visiting	1.00	1	-0.38	-0.14	0.09	0.14
Political	Legislation	-0.06	-0.38	1	0.41	0.81	0.41
	NR\$	0.60	-0.14	0.41	1	0.09	0.03
Professional	Publications: GS	0.14	0.09	0.81	0.09	1	0.26
Cons Actions	Cons Actions	-0.31	0.14	0.41	0.03	0.26	1

TABLE 10.11. Critical values (p) of spearman's ranked correlation coefficient (r_s) for six ASAs (Table by author, data source: Table 10.6).

The overall null hypothesis (H_0) was that there is no significant correlation between any of the pairs of sets of rank ordered indicator values. For the six UCH sites there were three pairs of sets of rank ordered interest indicators with *very strong* (VS) (very likely significant) rank order correlations (r_s) between them (Tables 10.7 and 10.10). For the following pairs of sets of rank ordered indicators the null hypothesis (H_{1o}) was rejected with at least 95% confidence:

$H_{1o(2)}$ *Public (reading) and Political (legislation)*: ($r_s = 0.95$, $n=6$, $p < 0.05$).

$H_{1o(3)}$ *Public (reading) and Political (NR\$)*: ($r_s = 0.95$, $n=6$, $p < 0.05$).

$H_{1o(10)}$ *Political (legislation) and Political (NR\$)*: ($r_s = 1.0$, $n=6$, $p < 0.01$).

For the six UCH sites there were five pairs of sets of rank ordered interest indicators, with *strong* (S) or possibly significant rank order correlations (r_s) between them (Tables 10.7 and 10.10). For the following pairs the null hypothesis (H_{1o}) was rejected with at least 80% confidence:

$H_{1o(1)}$ *Public (reading) and Public (Visiting)*: ($r_s = 0.66$, $n=6$, $p < 0.20$).

$H_{1o(4)}$ *Public (reading) and Prof. (Publications)*: ($r_s = 0.64$, $n=6$, $p < 0.20$).

$H_{2o(1)}$ *Public (reading) and Conservation Actions*: ($r_s = 0.61$, $n=6$, $p < 0.20$).

$H_{1o(11)}$ *Political (legislation) and Prof. (Publication)*: ($r_s = 0.71$, $n=6$, $p < 0.20$).

$H_{1o(13)}$ *Political (NR\$) and Prof. (Publications)*: ($r_s = 0.70$, $n=6$, $p < 0.20$).

There were no pairs of sets of rank ordered interest indicators for the six UCH sites that had a very strong (VS) correlation with rank ordered *conservation actions* (Table 10.7). For *public interest reading* with *conservation actions* there was a *strong* (S) rank order correlation between them (Tables 10.7 and 10.10). For this paired set of rank ordered indicators the null hypothesis (H_{2o}) was rejected, with at least 80% confidence.

For ASAs there was one paired set of rank ordered interest indicators with *very strong* (very likely significant) rank order correlations (r_s) between them (Table 10.8). For this set the null hypothesis (H_{1o}) was rejected, with at least 95% confidence:

$H_{1o(1)}$ *Public (reading) and Public (Visiting)*: ($r_s = 1.00$, $n=6$, $p < 0.01$).

For ASAs there was one paired set of rank ordered interest indicators with strong (possibly significant) rank order correlations (r_s) between them (Tables 10.8 and 10.11). For this paired set of rank ordered indicators the null hypothesis (H_{1o}) was rejected with at least 80% confidence:

$H_{1o(11)}$ *Political (legislation) and Prof. (Publications)*: ($r_s = 0.81$, $n=6$, $p < 0.20$).

Discussion

The *Cyclical Public Policy Process* (CPPP) model (Kraft and Furlong (2007:71-72) assumes a *traditional* management system with predictable sequence from cause to effect, as from one level of *player's interest* to the next (Figure 10.1). Data for *interest indicators* and *conservation actions* UCH sites and ASAs was analyzed from the perspective of this CPPP model by rank ordering sets of *interest indicators* and *conservation actions*. To identify and provide measures of strength and significance of correlations between rank ordered paired sets of indicators for UCH sites, and for ASAs, Spearman *Rank Correlation Coefficients* (r_s) were calculated (Stephens 2004:215; Hauke and Kossowski 2011:89). The *null hypothesis* (H_0) tested was that there is no correlation between levels of players' (*public, political, and professional*) interests, or between them and *conservation actions* for either the six UCH sites or ASAs.

For data so analyzed the null hypothesis was only rejected with over 95% confidence for three sets of indicators for UCH sites. For the UCH sites data sets there was *very strong* correlation between levels of *reading public interest* and *political interest*. There was a *strong*

correlation between *public interest (reading and visiting)* and both *political interest (legislation and NR\$)* and *professional interest (by Google Scholar publications)*. Also, between *public interest (reading)* and *conservation actions* taken.

Some degree of significant correlation, and hence of predictability, was thus found between levels of some *players interests* in UCH sites and *conservation actions* by Spearman Rank Correlation Coefficients (r_s) calculated for rank ordered paired sets of indicators. These results appear consistent with some cause and effect relationships between levels of *public, political, professional interest, and conservation actions* as might be predicted by Kraft and Furlong's (2007) CPPP model (Figure 2.1). From which the nature and behavior of the system by these factors for these six UCH sites as analyzed collectively can be characterized as *traditional*.

Time Series Analyses and Dynamic Systems Model

To investigate the nature and behavior of the six UCH sites and ASAs as individual systems and how *players' interests* and *conservation actions* might change over time, data was analyzed by time series analysis from the perspective of Dooley and Van de Ven's (1999) model, as used by Haynes (2008) for characterizing dynamic systems. Two *null hypotheses* were tested: 1) there is no change in levels of players' interests over time, and 2) it is not possible to visually identify type of change from the change pattern of data plotted versus time as proposed by Dooley and Van de Ven (1999) and Haynes (2008). Analyses of data were undertaken in four stages. First, biennial totals for each interest indicator for each UCH site and ASA were plotted versus time. Second, biennial year-to-year percentage change (BY2Y%) in interest indicator totals were calculated and plotted versus time. Third, BY2Y% change values were plotted as return plots (value at time t versus value at time $t+1$). All charts were plotted by the author using

Excel. Plots were visually compared with time series and return plots for identified types of change patterns as described in Chapter 2, and as reproduced in Figures 10.4-10.7. By visual comparisons with these change patterns for each set of *players' interest* indicator values was identified as: *periodic, random, chaotic, or complex*.

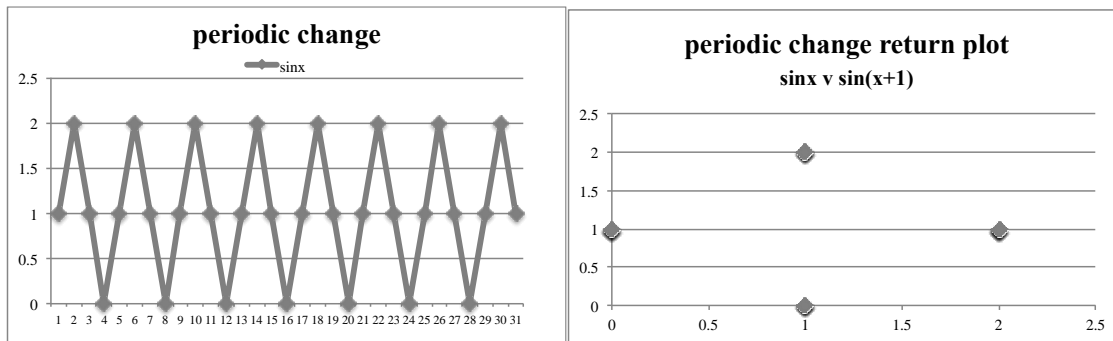


FIGURE 10.4. Periodic change pattern and return plot: mathematically generated (in Excel) time series (left) and return plot (right) for periodic change over time for one variable. (Figures by author, data source: Kenney 2018).

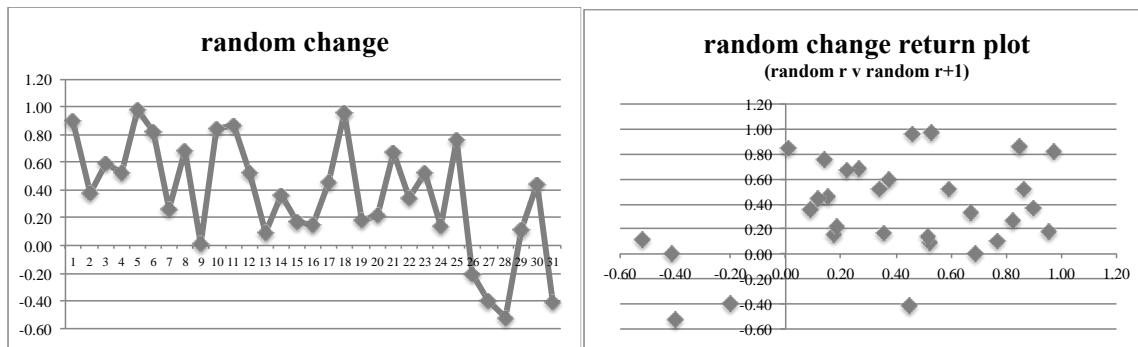


FIGURE 10.5. Random change pattern and return plot: mathematically generated (in Excel) time series (left) and return plot. (Figure by author, data source: Kenney 2018).

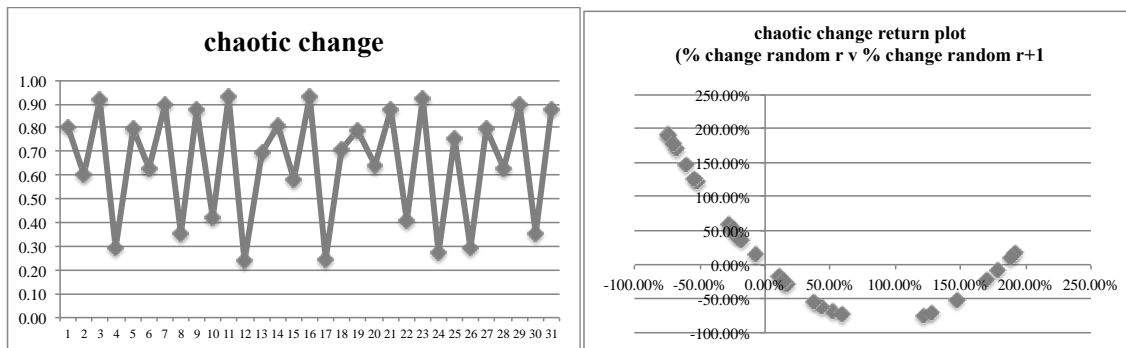


FIGURE 10.6. Chaotic change pattern and return plot: mathematically generated (in Excel using May (1976) logistics equation) time series (left) and return plot (right). (Figure by author, data source: Kenney 2018).

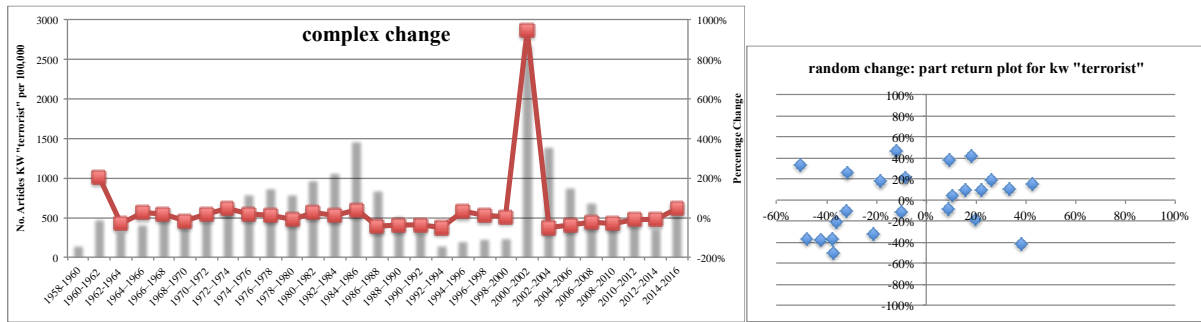


FIGURE 10.7. Complex change pattern (left) and return plot (right): biennial year-to-year percentage changes in number articles per 100,000 total North Carolina articles (ANHC) per biennial fiscal year for keyword searches for “terrorist”. Return plot for period before 2000-2002. (Figures by author, data source: ANHC (2018)).

Dooley and Van de Ven’s (1999:364) proposed a matrix model by which if a change pattern was visually identified the nature of causality in the system could be inferred (Table 10.12). For each dynamic change pattern two characteristics of the system could be inferred: dimensionality (as in number of variables) and nature of the interactions between them. For example, if a time series change pattern identified as *periodic* could indicate a system with low dimensionality (few variables) and no or linear interactions between those variables.

		Dimensionality of Causal System	
		Low Dimensionality (Few Variables)	High Dimensionality (Many Variables)
Nature of Interaction between Causal Factors	No Interaction or Linear Interaction	Periodic	Random
	Nonlinear Interaction	Chaotic	Complex

TABLE 10.12. Matrix Model for characteristics of observed dynamics and causal systems for types of change over time. (Table by author after Dooley and Van de Ven 1999:364; Haynes 2008:406).

Time Series Change Patterns for Public Interest - Reading

Indicator data for levels of *reading public interest* in the six UCH sites and ASAs were numbers of relevant articles found for keyword searches of North Carolina newspapers via ANHC (2018) online database (as described in Chapter 7). This data was analyzed by time series and return plots to investigate the nature of change over time for different data sets as follows.

Actual Total Numbers all North Carolina Articles

Change over time for actual total numbers of all North Carolina articles per biennium, and biennial year to year percentage changes (BY2Y%) in these total numbers were plotted (Figure 10.8). The change pattern for this time series and its return plot appears to be *random* by comparison with Figure 10.5. By Dooley and Van de Ven's matrix model (Table 10.12) this indicates a system with high dimensionality (many variables) and no or linear interactions between those variables.

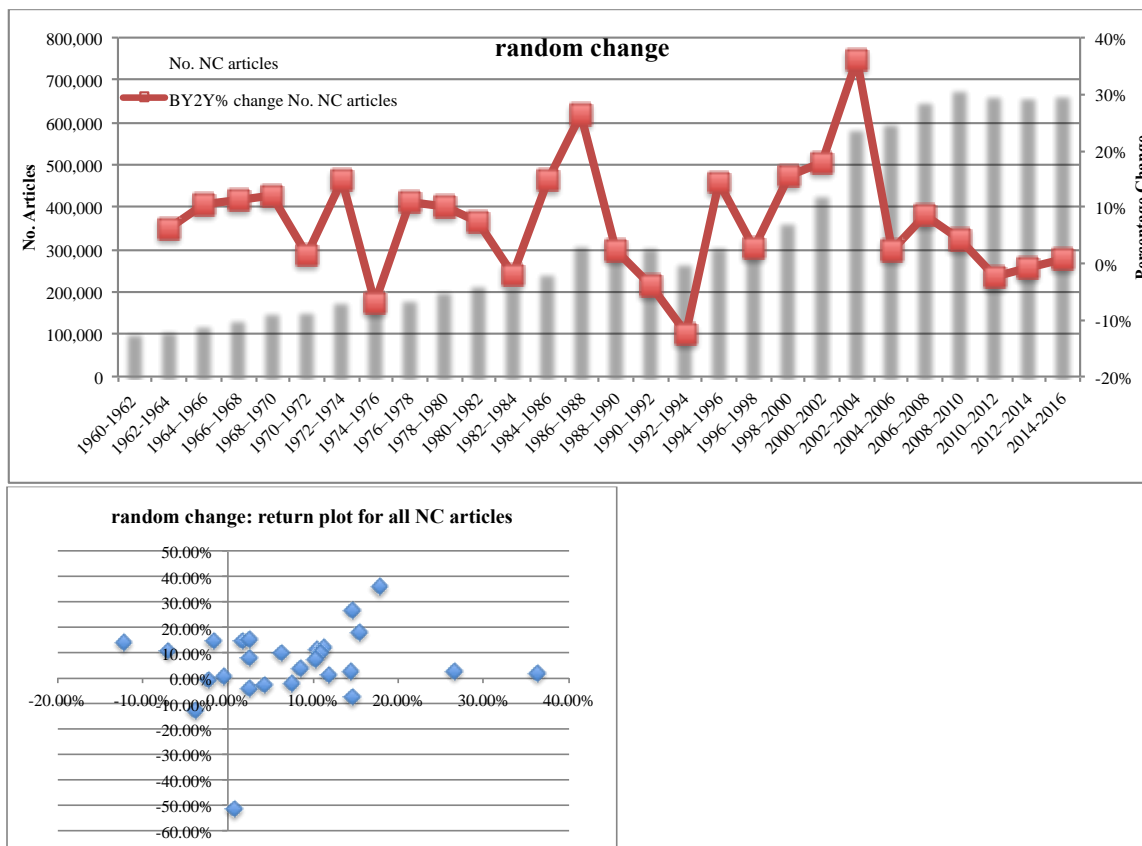


FIGURE 10.8. Random change: time series (above) and return plot (below) for biennial year-to-year percentage changes in actual totals for all articles in North Carolina sources per biennial fiscal year. Total actual $n=9,357,240$. (Figures by author, data source: ANHC (2018)).

Normalized Total Numbers of all North Carolina Articles

The actual total numbers of all North Carolina articles changed each biennial fiscal year (1960-2016) as shown in Figure 10.8. Data (numbers of articles) for the six UCH sites and ASAs

were therefore *normalized* per 100,000 of the total actual number of North Carolina articles for each biennium. BY2Y% changes in normalized numbers of articles were then calculated and plotted in time series and return plot charts generated in Excel. Normalized totals and BY2Y% change values for combined totals of relevant articles for the six UCH sites are plotted in Figure 10.9. The change pattern of which appears to be *complex*, by comparison with Figure 10.7. By Dooley and Van de Ven’s matrix model (Table 10.12) this indicates a system with high dimensionality (many variables) but nonlinear interactions between those variables.

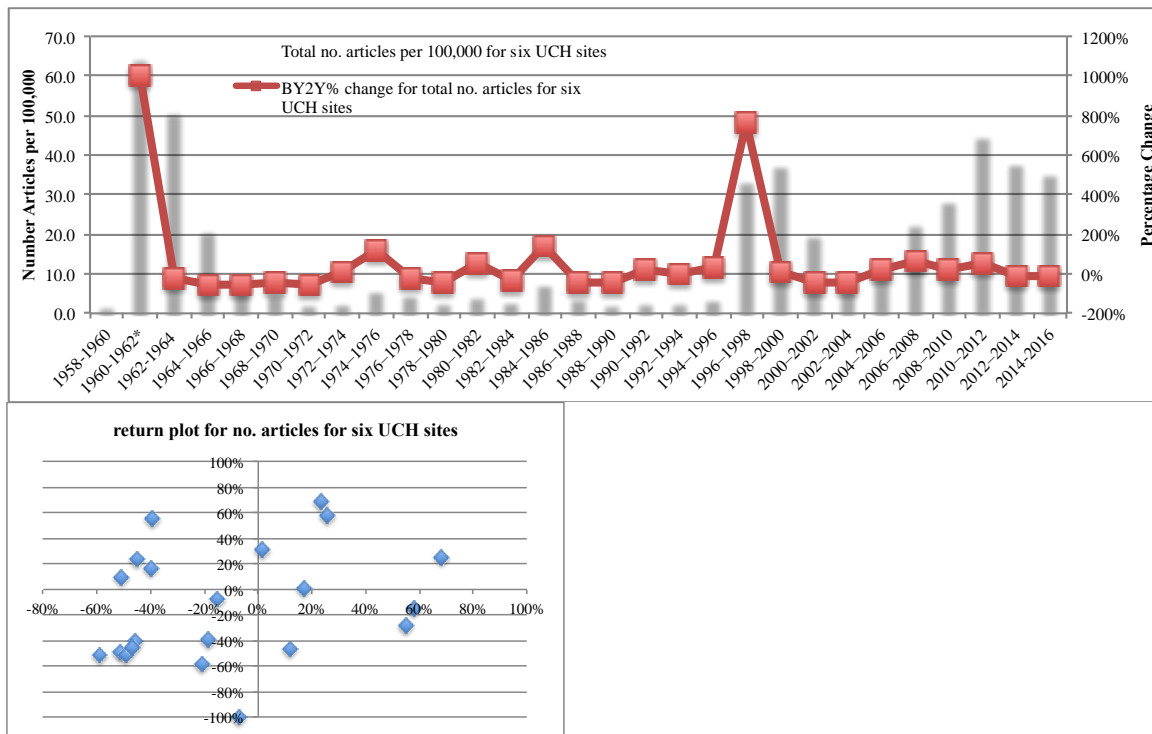


FIGURE 10.9. Complex change: time series (above) and return plot (below) for biennial year-to-year percentage changes in normalized number articles (per 100,000) per biennial fiscal year for all six UCH sites (normalized n=488). Note: for 1960-1962 percentage change value was actually 3,133 percent but reduced to fit the plot. (Figure by author, data source: ANHC (2018)).

Normalized Numbers of Articles for Six UCH Sites

BY2Y% changes in normalized numbers of articles per biennium as found on keyword searches of ANHC (2018) for each of the six UCH sites are plotted separately in Figure 10.10.

By visual comparison with Figure 10.7 the time series change patterns for five of the UCH sites

(*Modern Greece*, *CSS Neuse*, Lake Phelps Canoes, *USS Huron*, and *Queen Anne's Revenge*) appear to be *complex*. By Dooley and Van de Ven's matrix model (Table 10.12) this indicates systems with high dimensionality (many variables) but nonlinear interactions between those variables. The change pattern (Figure 10.10) for Corolla and shipwrecks appears *random* by comparison to Figure 10.5. By Dooley and Van de Ven's matrix model (Table 10.12) this would indicate a system with high dimensionality (many variables) and no or linear interactions between those variables.

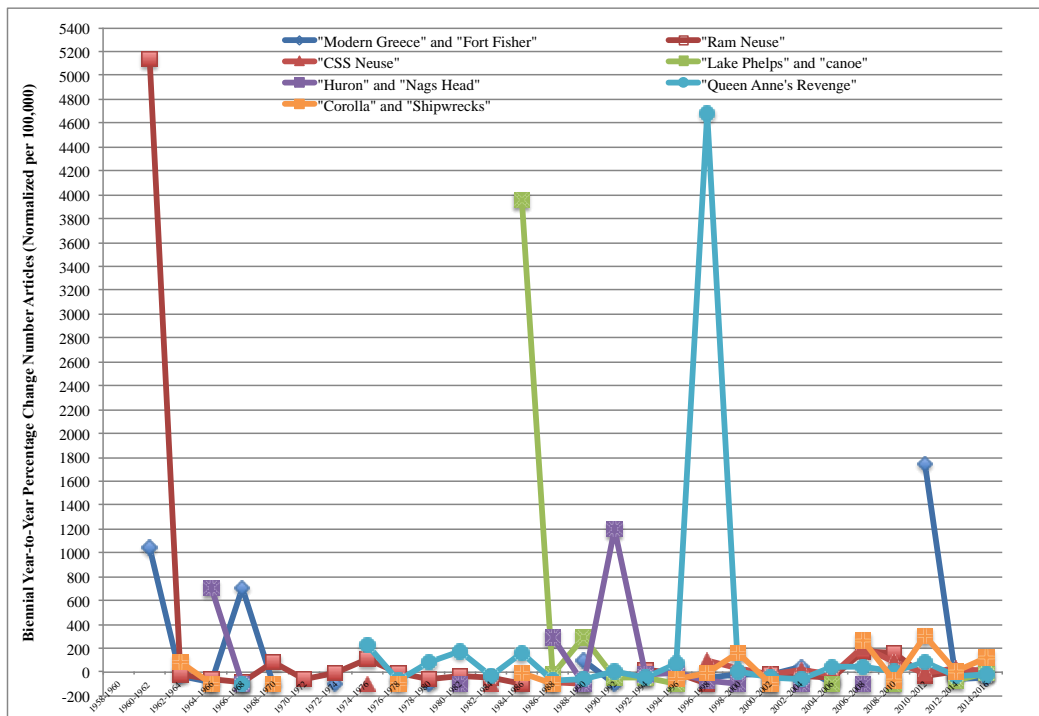


FIGURE 10.10. Complex change: time series for biennial year-to-year percentage changes in normalized number articles (per 100,000) North Carolina sources (ANHC) per biennial fiscal year for keyword searches for six UCH sites. (Figure by author, data source: ANHC (2018)).

The sudden large peaks (Figure 10.10) coincide with rare “transformative” events for some UCH sites: the recovery of *CSS Neuse* (1962-1964), discovery of canoes in Lake Phelps (1985-1986), creation of *USS Huron* shipwreck preserve (1991), and discovery of *Queen Anne's Revenge* (1996-1998). The two peaks for *Modern Greece* in its time series plot coincide with its salvage (1960-1962) and 150th anniversary of its loss (1862) in 2010-2012. The transformative

event indicated in the time series plot for BY2Y% change in *reading public interest* in Lake Phelps canoes appears to come out of nowhere – with no previous interest. This is not surprising as the existence of the canoes was not known until they were revealed by unusually low water levels in the lake in 1985-1986 (as described in Chapter 6).

For the four UCH sites that are identified shipwrecks the sudden increase in public interest on their discovery, however, does not come out of nowhere. Their history, and in some cases locations, were previously known and stories of their loss often told in articles in North Carolina newspapers. Newspaper articles on these four UCH sites were found by the author on keyword searches of 19th and 20th century North Carolina newspaper databases (ANHC; HNCDNC). For *Queen Anne’s Revenge* there had been *reading public interest* in it since at least three decades prior to its discovery in November 1996. For *Modern Greece*, a time series plot of actual numbers of relevant articles per calendar year from 1860 to 2016 suggests a *complex* change pattern. Three transformative events marked by sudden large peaks in numbers of articles coincide with its loss in 1862, its rediscovery in 1962, and the 150th anniversary of its loss in 2012 (Figure 10.11).

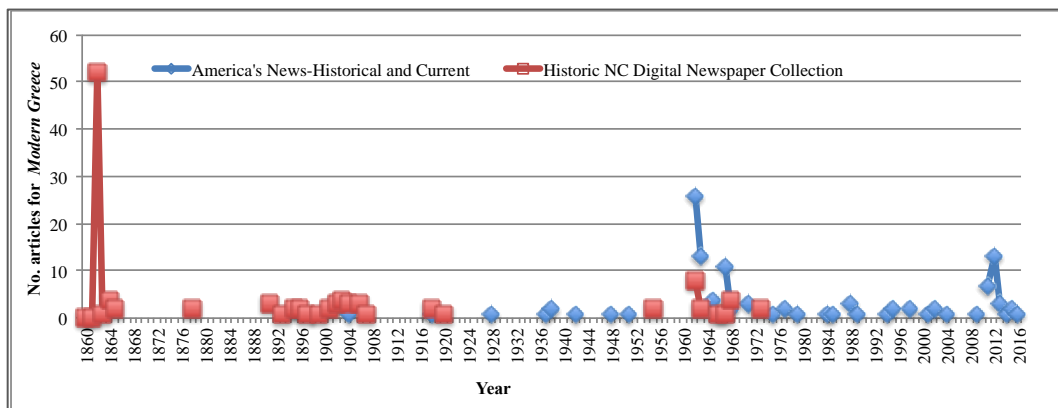


FIGURE 10.11. Actual number articles per year on keyword searches for articles related to *Modern Greece* 1860-2016, in North Carolina sources in ANHC and HNCDNC. ANHC n=123; HNCDNC n=110. Peaks are at 1862, 1962, 2012. (Figure by author, data sources: ANHC (2018); HNCDNC (2018)).

Normalized Number of Total Articles for Six ASA Sites

Combined data for normalized total numbers of relevant articles for *reading public interest* in six ASAs over time are plotted in Figure 10.12. The change pattern appears to be *random* when compared to Figure 10.5. By Dooley and Van de Ven’s matrix model (Table 10.12) this suggests a system with high dimensionality (many variables) and no or linear interactions between those variables.

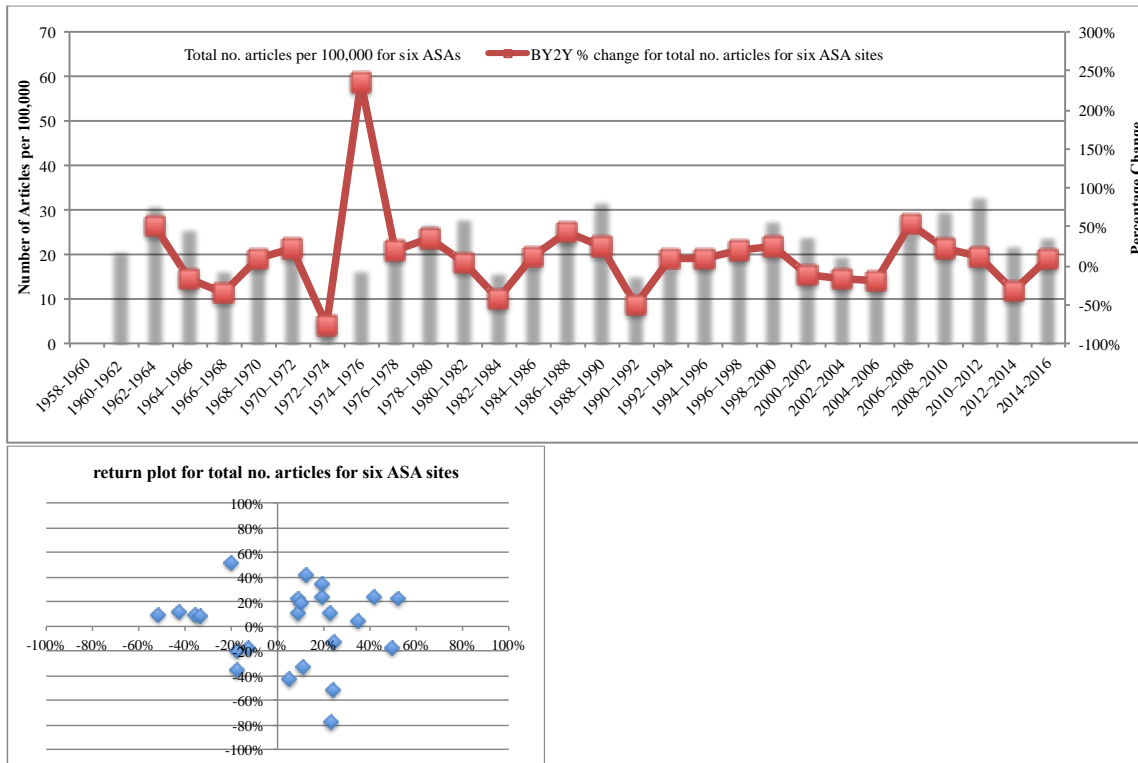


FIGURE 10.12. Random change: time series (above) and return plot (below) for biennial year-to-year percentage changes in number articles per 100,000 articles in North Carolina sources per biennial fiscal year for combined results for keyword searches for all six ASAs (normalized n=488). (Figure by author, data source: ANHC (2018)).

Normalized Numbers of Articles for Six ASA Sites

The change patterns of time series plots of normalized numbers of articles for each ASA individually appear to be *random* (Figure 10.13). The return plots (Figure 10.14 c-f) for Fort Fisher Historic Site, CSS *Neuse* Historic Site, Jockeys Ridge State Park, and NC Maritime Museum also appear to have a *random* change pattern when compared to Figure 10.5. By Dooley

and Van de Ven's matrix model (Table 10.12) this would indicate a system with high dimensionality (many variables) and no or linear interactions between those variables.

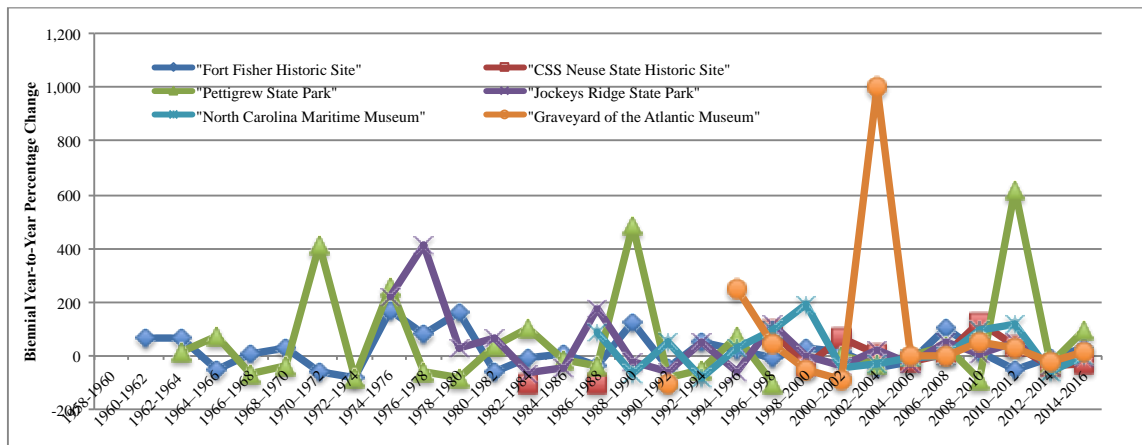


FIGURE 10.13. Time series plots for biennial year-to-year percentage changes in articles per 100,000 articles in North Carolina sources (ANHC) for keyword searches for each of six ASA sites. (Figure by author, data source: ANHC (2018)).

For Graveyard of Atlantic Museum, the change pattern (Figure 10.13) could be *complex*, with a transformative event in 2002-2004 when the museum became part of A&H. By Dooley and Van de Ven's matrix model (Table 10.12) this suggests a system with high dimensionality (many variables) but nonlinear interactions between those variables.

The return plot (Figure 10.14a) for Pettigrew State Park appears to form a parabolic curve indicative of a *chaotic* change pattern when compared to Figure 10.6. If, however, the return plot is rescaled to include just values between -100 and +100 BY2Y% change the pattern is more like that for *random* change (Figure 10.14b). By Dooley and Van de Ven's matrix model (Table 10.12) if *chaotic* this would indicate a system with low dimensionality (few variables) but nonlinear interactions between those variables. If *random* the pattern would indicate a system with high dimensionality (many variables) and no or linear interactions between those variables.

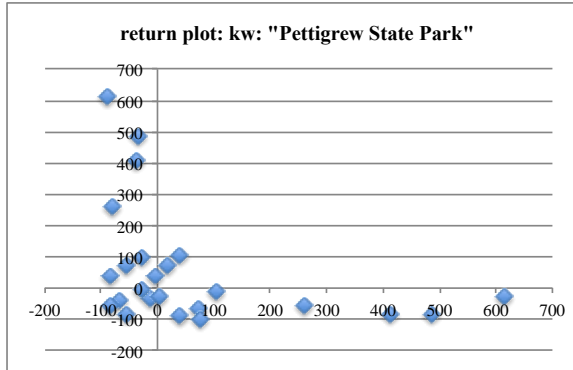


Figure 10.14a

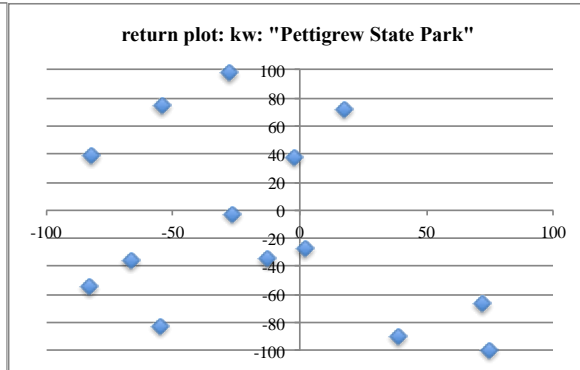


Figure 10.14b

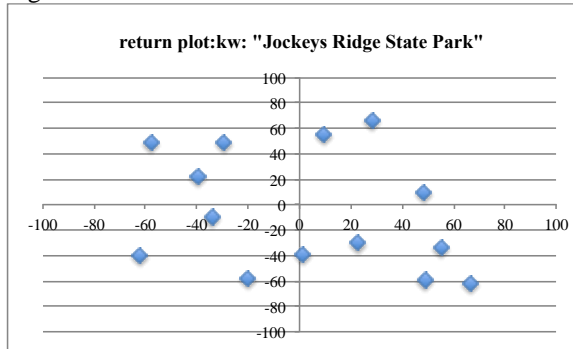


Figure 10.14c

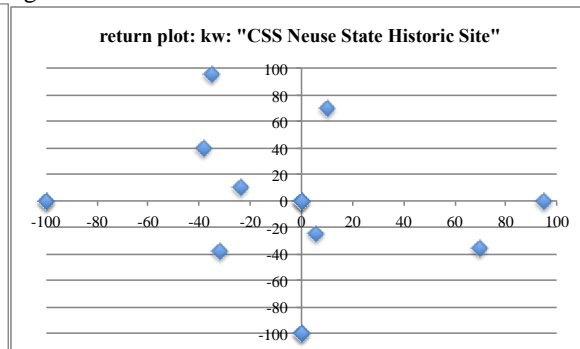


Figure 10.14d

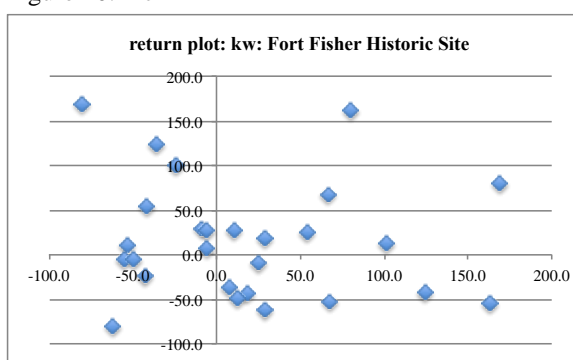


Figure 10.14e

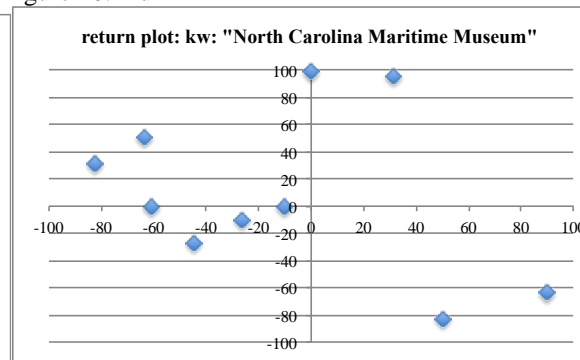


Figure 10.14f

FIGURE 10.14a-f. Return plots for biennial year-to-year percentage changes in number articles per 100,000 articles in North Carolina sources (ANHC) per biennium, for keyword searches for six ASA sites. (Figures by author, data source ANHC (2018)).

Time Series Change Patterns for Public Interest - Visiting

Indicator data for *visiting public interest* in ASAs were numbers of visits per biennium to each location, as described in Chapter 7.

Total Visits to Four ASAs

The time series change pattern for combined data for numbers of visits to four ASAs (Fort Fisher Historic Site, CSS *Neuse* Historic Site, NC Maritime Museum, and Graveyard of the Atlantic Museum) could be *random* (Figure 10.15). The return plot pattern, however, appears a *chaotic* when compared to Figure 10.6. By Dooley and Van de Ven's matrix model (Table 10.12) if *chaotic* this would indicate a system with low dimensionality (few variables) but nonlinear interactions between those variables. If *random* it suggests a system with high dimensionality (many variables) and no or linear interactions between those variables.

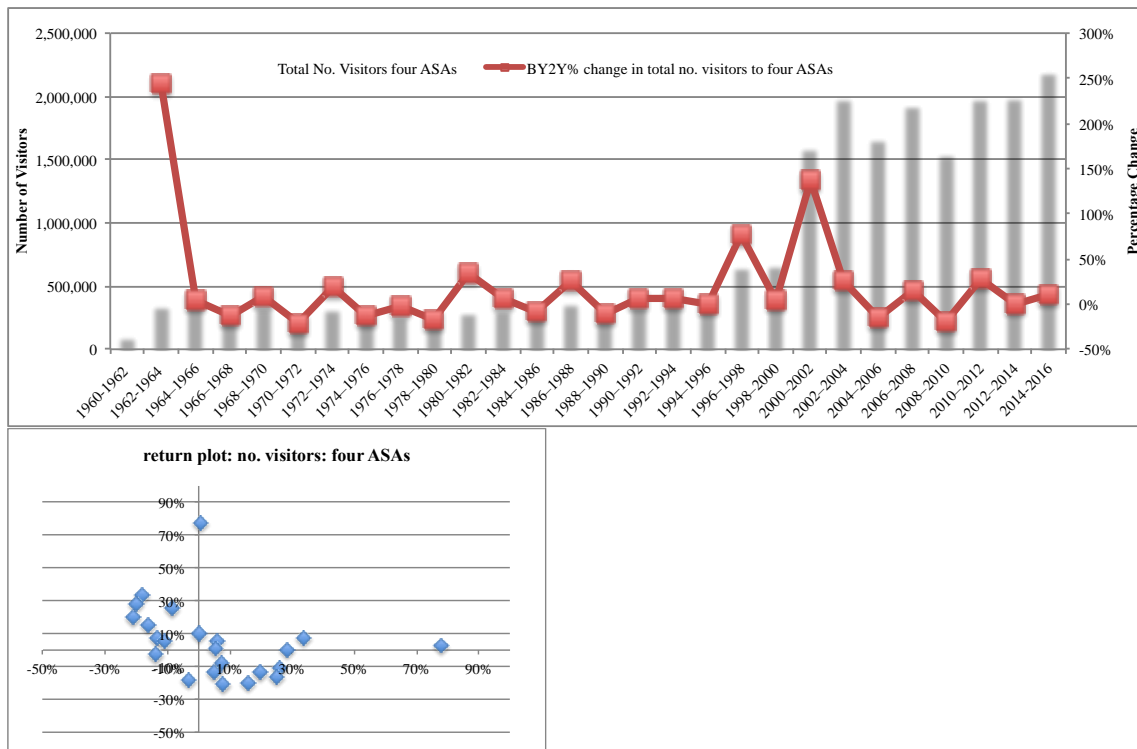


FIGURE 10.15. Time series (above) and return plot (below) for total actual visitor numbers and biennial year-to-year percentage changes in numbers of visitors to four ASAs (Fort Fisher Historic Site; CSS *Neuse* Historic Site, North Carolina Maritime Museum, Graveyard of the Atlantic Museum). (Figures by author, data source: NC A&H Biennial Reports).

Numbers of Visits to ASA Sites

BY2Y% change for visit number of visits to ASAs are plotted separately in Figure 10.16. The return plot pattern for Fort Fisher Historic Site (Figure 10.17a) appears to be *chaotic* when compared to Figure 10.6. By Dooley and Van de Ven's matrix model (Table 10.12) this would indicate a system with low dimensionality (few variables) but nonlinear interactions between those variables. The return plot patterns for CSS *Neuse* Historic Site and North Carolina Maritime Museum appear to be *random* (Figure 10.17b and c) indicating systems with high dimensionality (many variables) but no or linear interactions between variables.

BY2Y% changes were mostly between -40% and +40% (Figure 10.16). There is one large initial BY2Y% change (260%) for CSS *Neuse* Historic Site. This coincides with the transformative event of the opening of the CSS *Neuse*/Caswell Memorial Historic Site during the 1966-1968 biennium. The second highest BY2Y% increase (80%) in visitors to Fort Fisher Historic Site for biennium 2000-2002 coincides with reopening of the Fort Fisher Historic Site and Visitor Center following repairs and refurbishment after the hurricanes of 1999.

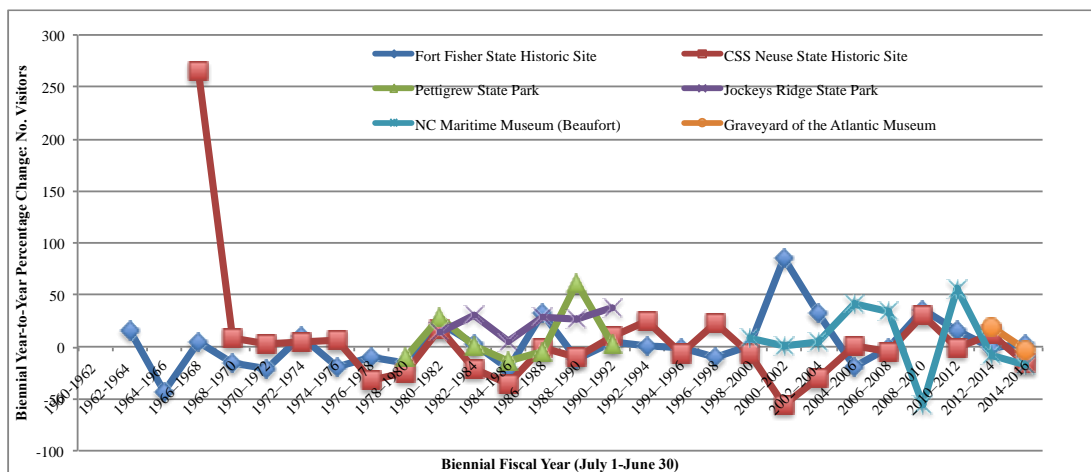


FIGURE 10.16. Biennial year-to-year percentage changes in numbers of visitors to six ASA sites per biennium. (Figure by author, data source: NC A&H Biennial Reports).

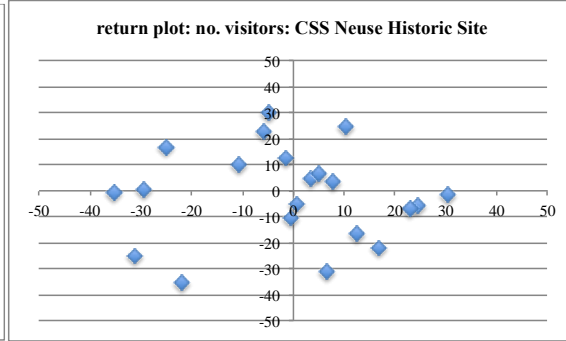
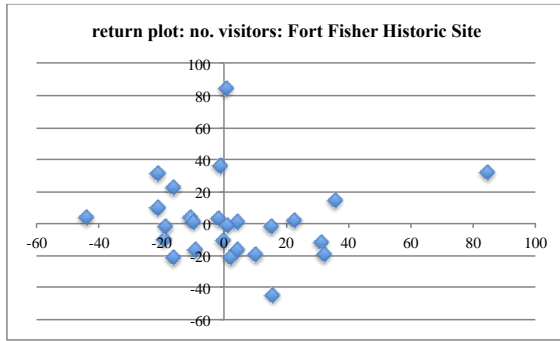


FIGURE 10.17a

FIGURE 10.17b

FIGURE 10.17 a-b. Return plots for biennial year-to-year percentage changes in numbers of visitors to ASAs: a) Fort Fisher Historic Site (*chaotic* change pattern); b) CSS *Neuse* Historic Site (*random* change pattern). (Figures by author, data source: NC A&H Biennial Reports).

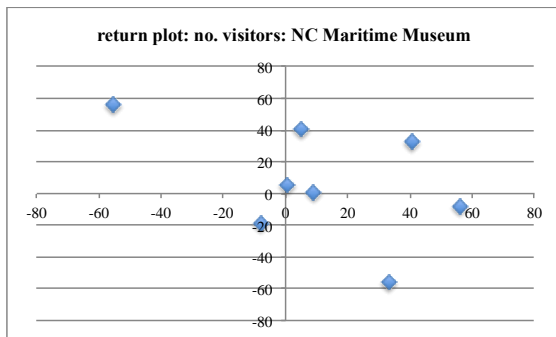


FIGURE 10.17c. Return plots for biennial year-to-year percentage changes in numbers of visitors to ASA North Carolina Maritime Museum (uncertain change pattern as too few data points). (Figure by author, data source: NC A&H Biennial Reports).

Time Series Change Patterns for Political Interest: Legislation

Numbers of NC Session Laws per biennium were one of the indicators for *political interest* in the six UCH sites and ASAs for which data was collected (as described in Chapter 8).

Total of All NC Session Laws

Time series and return plots for combined total numbers of NC Session Laws, from 1959 to 2016, appear to have *random change* patterns (Figures 10.18a, b) by visual comparison to Figure 10.5. By Dooley and Van de Ven's matrix model (Table 10.12) this would indicate a system with high dimensionality (many variables) and no or linear interactions between those variables.

Total Numbers of NC Session Laws for Three UCH Sites

For UCH sites, 25 directly related session laws were found by the author on search of NC Government website. These related to just three of the six UCH sites: *Modern Greece* (3), *CSS Neuse* (8), and *Queen Anne's Revenge* (14). Time series and return plots for the combined data totals could be a *random* change pattern but there are too few data points to determine the pattern (Figure 10.19a, b). By Dooley and Van de Ven's matrix model (Table 10.12) if *random* this would indicate a system with high dimensionality (many variables) and no or linear interactions between those variables.

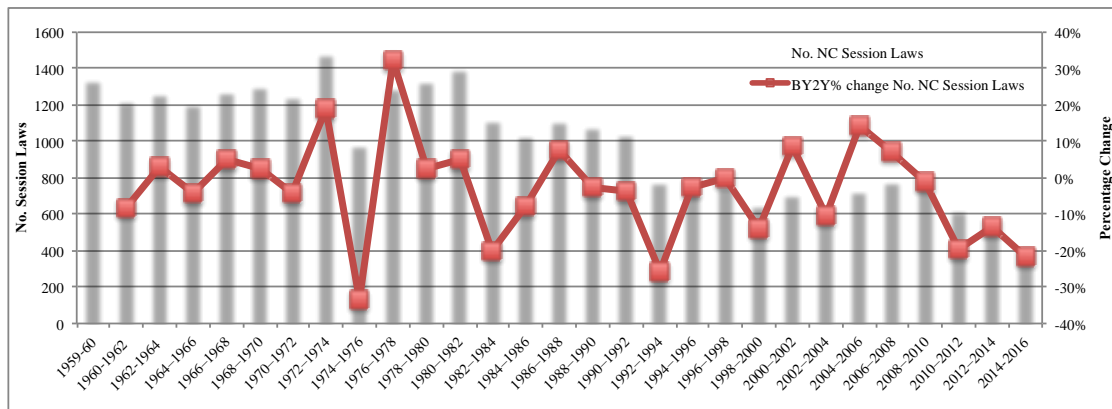


FIGURE 10.18a. Time series for all North Carolina Session Laws - total actual number of acts and biennial year-to-year percentage changes in numbers of Acts (n=28,899). (Figure by author, data source: NC Session Laws online).

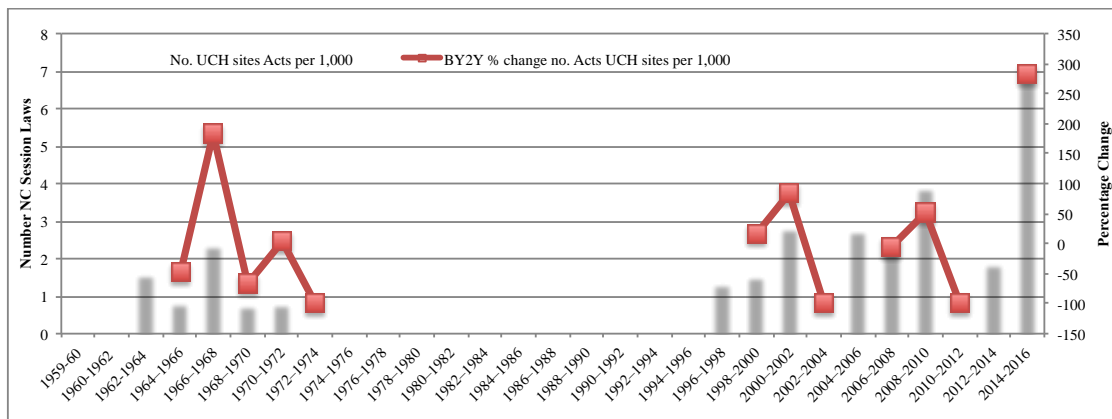


FIGURE 10.19a. Time series for 25 North Carolina Session Laws - total actual number of Acts and biennial year-to-year percentage changes in numbers of Acts (n=25) for *Modern Greece*, *CSS Neuse*, and *Queen Anne's Revenge*. (Figure by author, data source North Carolina Session Laws online).

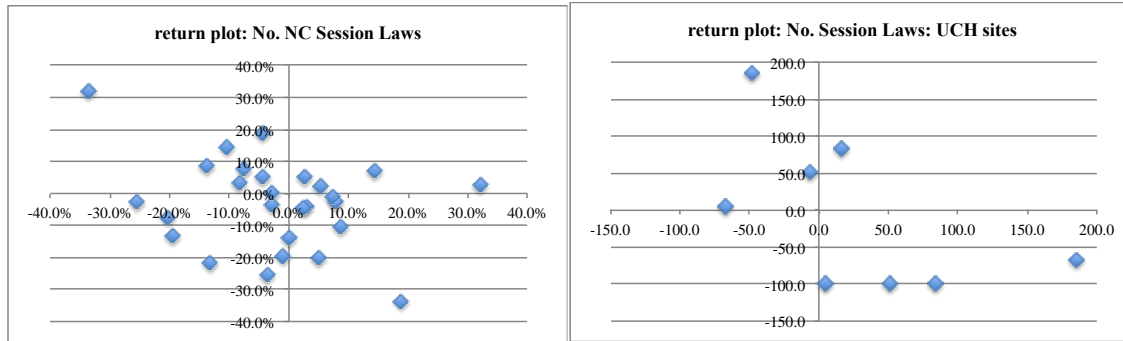


FIGURE 10.18b (left). Return plots for all North Carolina Session Laws - total actual number of Acts and biennial year-to-year percentage changes in numbers of Acts (n=28,899).

FIGURE 10.19b (right). Return plots for 25 NC Session Laws - total actual number of Acts and biennial year-to-year percentage changes in numbers of Acts (n=25) for *Modern Greece*, *CSS Neuse*, and *Queen Anne's Revenge*. (Figures by author, data source: NC Session Laws online).

Total Numbers of NC Session Laws for ASAs

For the six ASAs, 66 related session laws in total were found on the NC Government website. The time series plot for the combined totals appears to be a *random* change pattern (Figure 10.20).

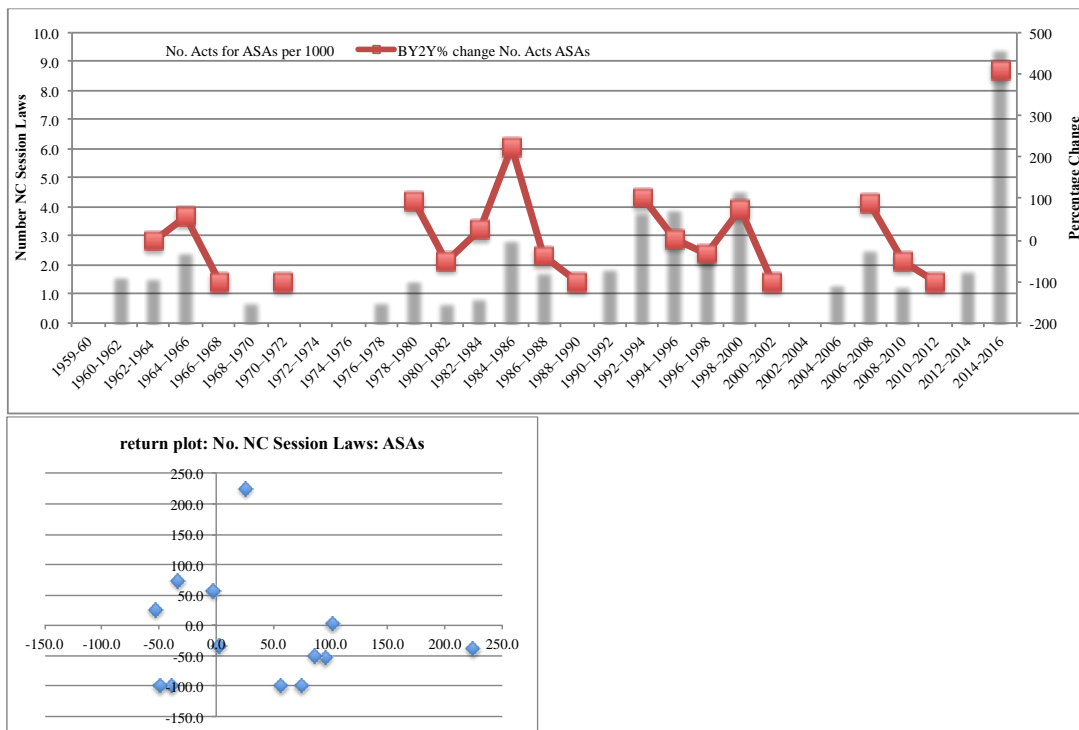


FIGURE 10.20. Time series (above) and return plot (below) for 66 North Carolina Session Laws - total actual number of Acts and biennial year-to-year percentage changes in numbers of Acts (n=66) for six ASAs. (Figures by author: data source: North Carolina Session Laws online).

The return plot pattern, however, is suggestive of a *chaotic* change pattern by visual comparison with Figure 10.6 but there are too few data points for certainty. By Dooley and Van de Ven's matrix model (Table 10.12) if *random* a system with high dimensionality (many variables) and no or linear interactions between those variables would be indicated. If *chaotic* it would be a system with low dimensionality (few variables) and nonlinear interactions between them.

Time Series Change Patterns for Political Interest: Appropriations

Amounts of recurring (R\$) and non-recurring (NR\$) appropriations were used in this study as one of the indicators for *political interest* in A&H, sections within A&H, the six UCH sites, and six ASAs (as described in Chapter 8).

Total Recurring Appropriations (R\$) for A&H from NC General Fund

The change pattern of the time series and return plot for totals and BY2Y% change in total recurring appropriations (R\$) from 1960 to 2016 for A&H appears to be *random* (Figure 10.21). By Dooley and Van de Ven's matrix model (Table 10.12) a *random* change pattern indicates a system with high dimensionality (many variables) and no or linear interactions between those variables.

Recurring Appropriations (R\$) for Sections with A&H and for QAR Project

The change pattern of the BY2Y% change time series for recurring appropriations (R\$) from 1960 to 2016 for A&H, all historic sites (HS), NC Maritime Museum (NCMM), Office of State Archaeology (OSA), and *Queen Anne's Revenge* (QAR) appear generally to be *random* (Figure 10.22). Return plots for historic sites and NCMM (Figure 10.23) also appear to be *random*. By Dooley and Van de Ven's matrix model (Table 10.12) a *random* change pattern

indicates a system with high dimensionality (many variables) and no or linear interactions between those variables.

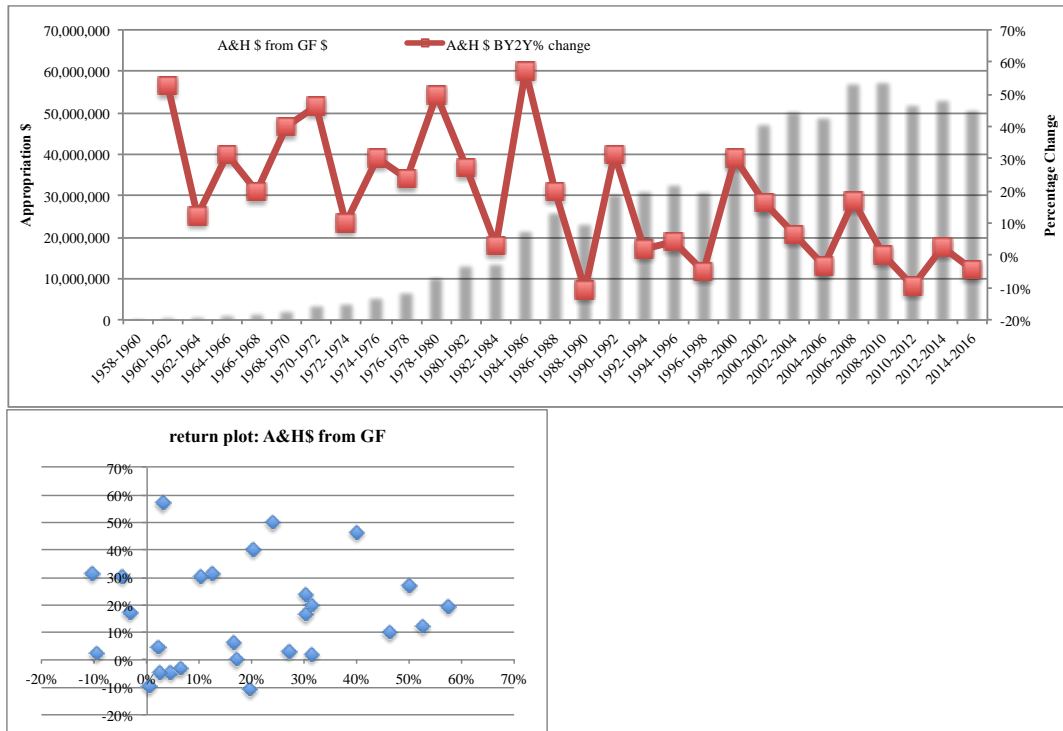


FIGURE 10.21. Time series (above) and return plot (below) for A&H total appropriations from North Carolina General Fund and biennial year-to-year percentage changes in appropriations. (Figures by author, data source: NC A&H Biennial Reports 1960-2016).

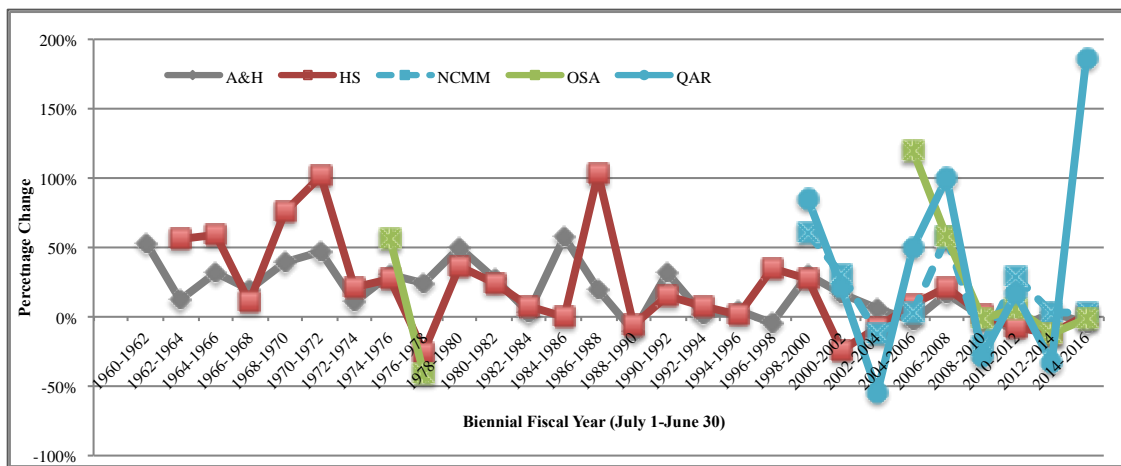


FIGURE 10.22. Time series plots for biennial year-to-year percentage changes in total appropriations (\$) for A&H; Historic Sites (HS); North Carolina Maritime Museum (NCMM), Office of State Archaeology (OSA), and Queen Anne's Revenge (QAR). (Figure by author, data source: NC A&H Biennial Reports 1960-2016).

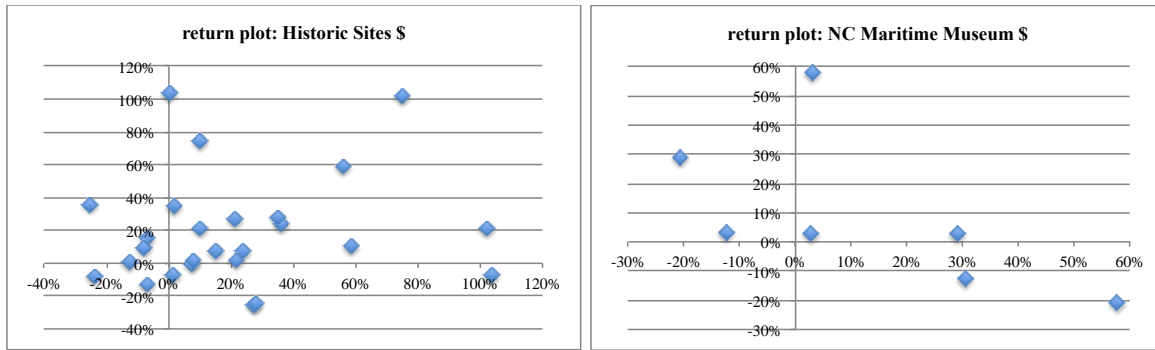


FIGURE 10.23. Return plots for biennial year-to-year percentage changes in total appropriations for historic sites (left) and for North Carolina Maritime Museum (right) 1960-2016. (Figures by author, data source: NC A&H Biennial Reports 1960-2016).

Actual Non-Recurring Appropriations (NR\$) for six UCH Sites and ASAs

The author was able to find data for *non-recurring appropriations* (NR\$) for only three of the UCH sites (*Modern Greece*, *CSS Neuse*, and *Queen Anne’s Revenge*), and five of the ASAs (Fort Fisher Historic Site, *CSS Neuse* Historic Site (same as UCH site), Pettigrew State Park, Jockey’s Ridge State Park, NC Maritime Museum, and Graveyard of the Atlantic Museum). For which the actual NR\$s per biennium are plotted below in Figure 10.24.

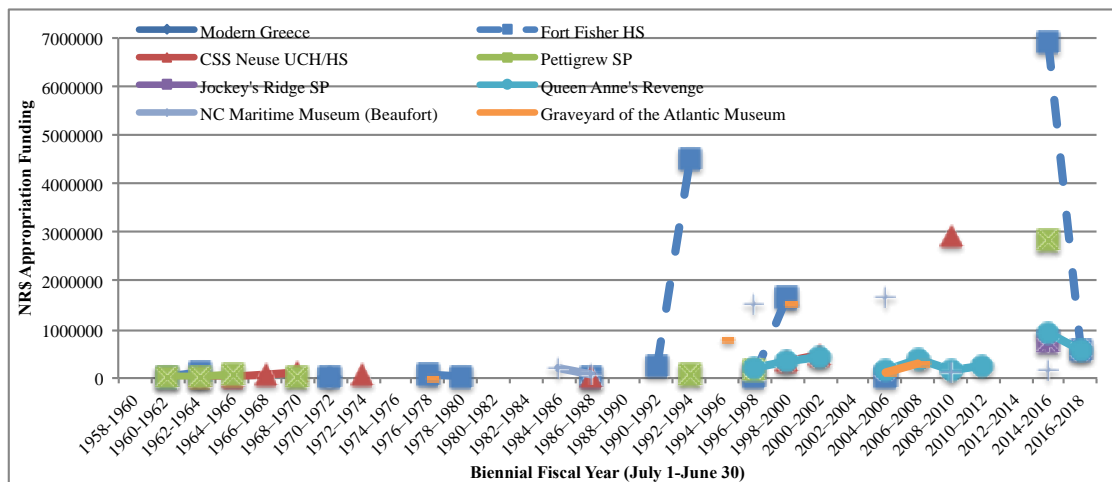


FIGURE 10.24. Actual amounts of *non-recurring appropriations* (NR\$) for three of UCH sites and six ASAs per biennium. (Figure by author, data source: NC A&H Biennial Reports (1960-2016)).

Funding for Queen Anne’s Revenge Project (QAR)

QAR was the only UCH case study site for which the author found data for funding (all sources) over a long enough period of time to construct time series and return plots. Over 20

years QAR received in total approximately \$9.0 million from various sources for field and conservation lab operations (Figure 10.25). Approximately \$4.0m (46%) was R\$, \$3.4m (37%) NR\$, \$1.0m (10%) was from grants, and \$0.64m (7%) through non-profit organizations. The time series change pattern for BY2Y% and return plot (Figure 10.26) for total funding from all sources, after 2000 appears to be *random* by comparison to Figure 10.5. By Dooley and Van de Ven’s matrix model (Table 10.12) a *random* change pattern indicates a system with high dimensionality (many variables) and no or linear interactions between those variables.

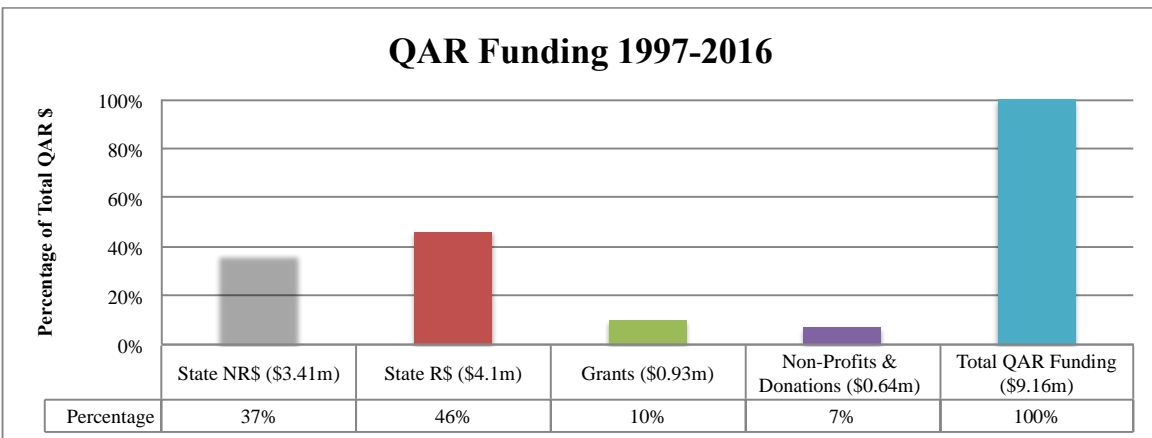


FIGURE 10.25. Funding for *Queen Anne’s* Revenge Project 1997-2016. (Figure by author, data sources: A&H/OSA/QAR annual budgets on file at A&H/OSA/QAR Lab).

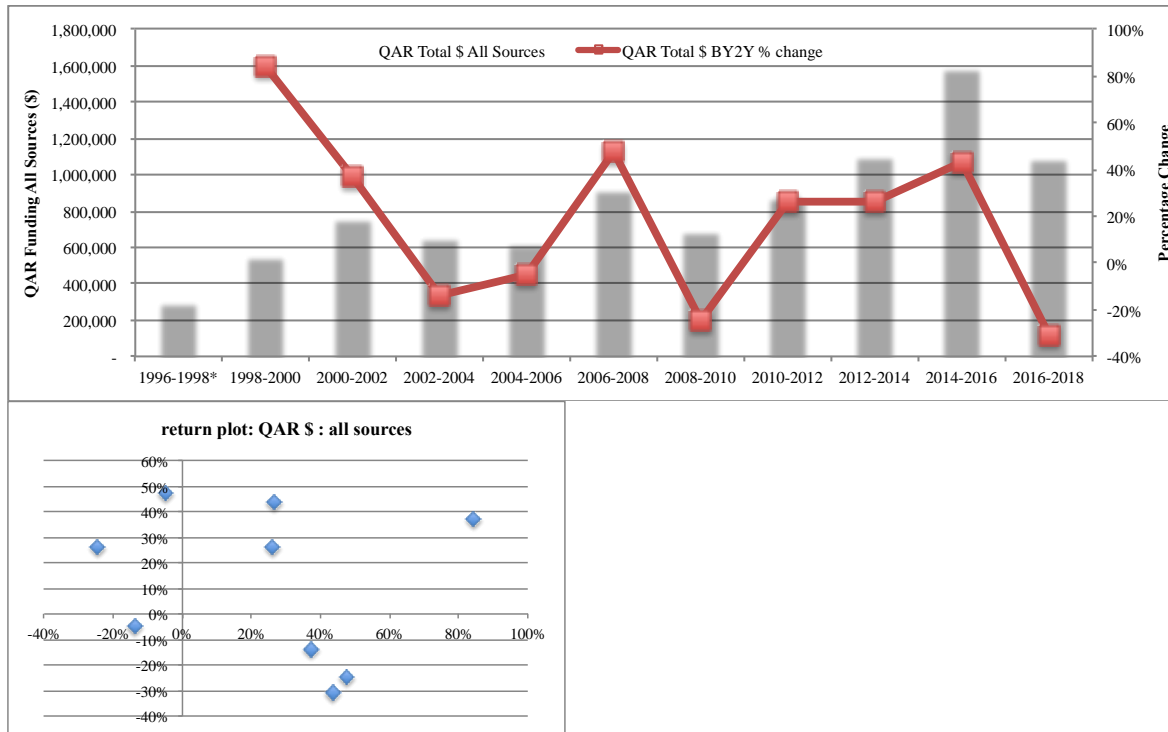


FIGURE 10.26. Time series (above) and return plot (below) for biennial year-to-year percentage change in all sources funding for *Queen Anne's Revenge* Project 1997-2016 (n=\$9.167 million). (Figures by author, data sources: A&H/OA/QAR annual budgets on file at A&H/OA/QAR Lab).

QAR – RECURRING APPROPRIATIONS (R\$)

Recurring appropriations (R\$) for QAR were entirely for permanent staff positions. R\$ increased in real terms slightly each year from 1996-1998 to 2004-2006 (Figure 10.27). The increase in 2006-2008 coincided with establishment of four additional QAR permanent staff positions within A&H/OA in 2006. The BY2Y% change pattern for recurring appropriations (R\$) could be *complex* with transformative events in 1998-2000, and 2006-2008 but the return plot change pattern (Figure 10.27) appears to be *random*, although there are too few points to be certain. By Dooley and Van de Ven's matrix model (Table 10.12) a *complex* change pattern indicates a system with high dimensionality (many variables) and with nonlinear interactions between variables. A *random* change pattern indicates a system with high dimensionality (many variables) and no or linear interactions between those variables.

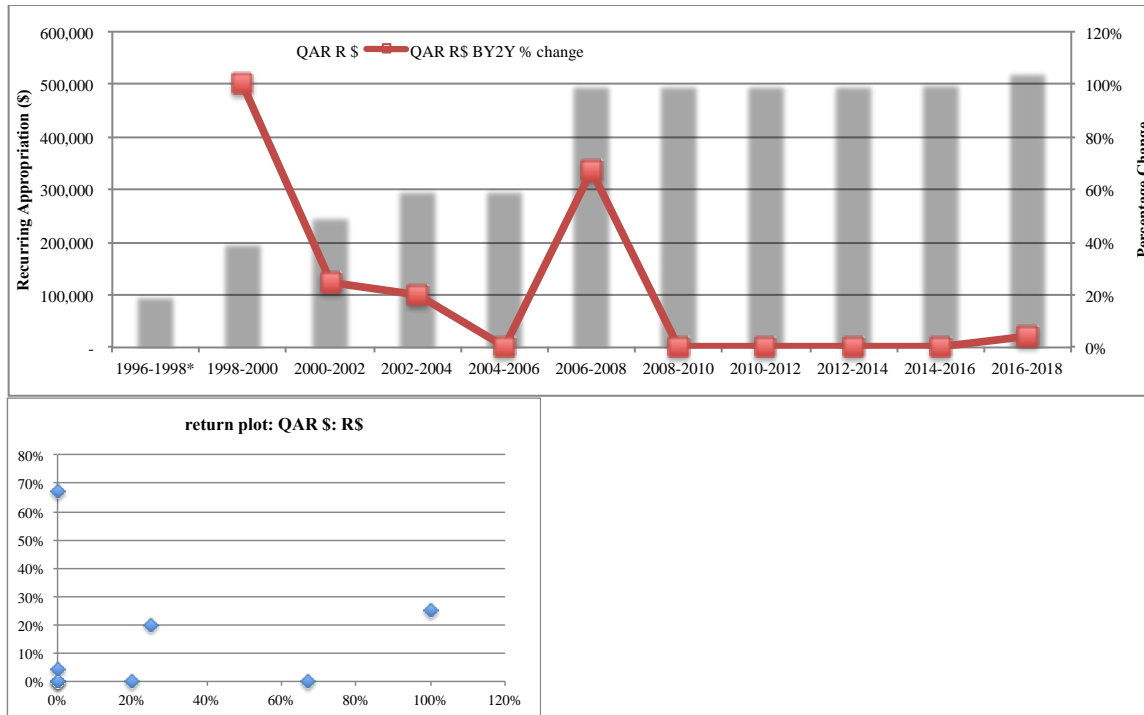


FIGURE 10.27. Time series (above) and return plot (below) for biennial year-to-year percentage change in recurring appropriations (R\$) for *Queen Anne's Revenge* Project 1997-2016 (n=\$4.179 million). (Figure by author, data source: A&H/OSA/QAR annual budgets on file at A&H/OSA/QAR Lab).

QAR – NON-RECURRING APPROPRIATIONS (NR\$)

Operational costs (field and lab) for QAR (1996-2018) were funded variously from state *non-recurring appropriations* (NR\$), grants and donations through non-profit organizations (Figure 10.25). The time series and return plots for BY2Y% change in NR\$ (Figure 10.28) appears *complex* by comparison to Figure 10.7. The sudden increase in 2014-2016 is due to an extraordinary NR\$ of \$1.5 million made in 2015 for the 2016-2018 fiscal biennium. This was to fund QAR Lab operations and NCMM exhibit costs in preparation for statewide events to mark the 300th Anniversary of the loss of the ship in June 1718 and death of Blackbeard in November 1718. As there was zero NR\$ the previous biennium the BY2Y% change for 2016-2018 was over 92m% but in Figure 10.28 this change is plotted as 4,000% to fit. There are too few data points in the return plot for BY2Y% change as scaled to 200 percent to visually identify a change pattern. By Dooley and Van de Ven's matrix model (Table 10.12) a *complex* change pattern

indicates a system with high dimensionality (many variables) and with nonlinear interactions between variables.

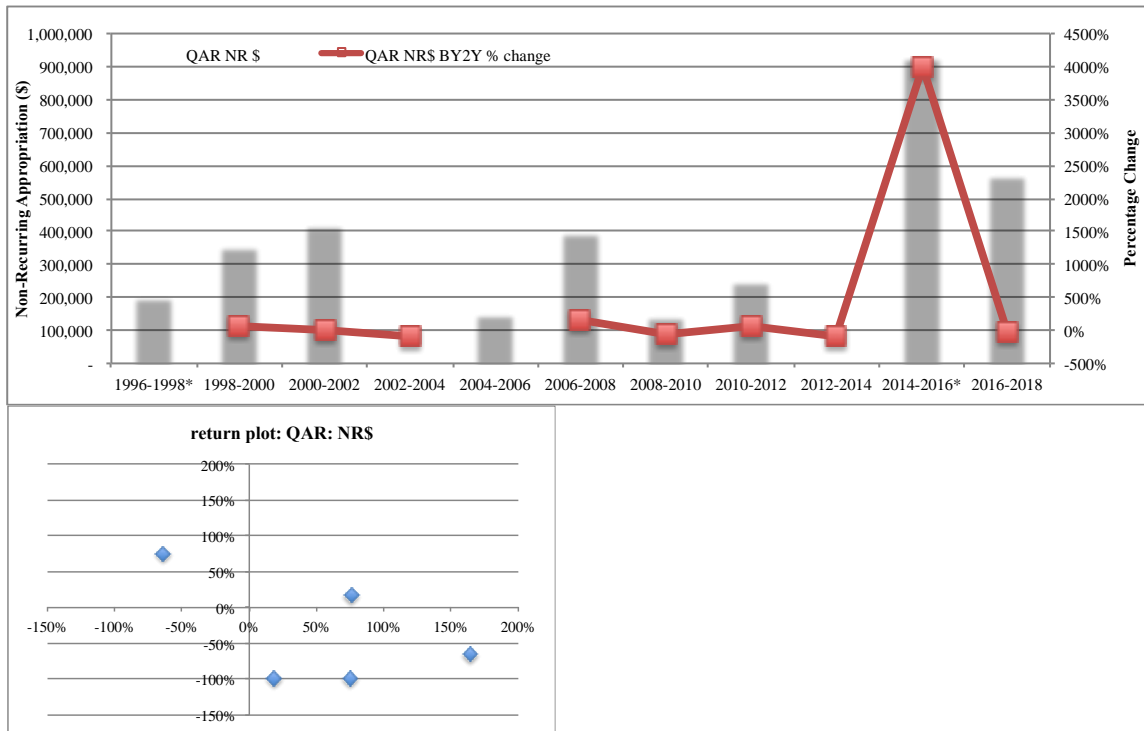


FIGURE 10.28. Time series (above) and return plot (below) for biennial year-to-year percentage change in non-recurring appropriations (NR\$) for *Queen Anne's Revenge* Project 1997-2016 (n=\$3.14 million). (Figures by author, data Source: A&H/OSA/QAR annual budgets on file at A&H/OSA/QAR Lab).

Non-Recurring Appropriations for two ASAs

Biennial *non-recurring appropriations* (NR\$) for Fort Fisher Historic Site and CSS *Neuse* Historic Site, from the early 1960s to 2014-2016, are plotted in Figure 10.29 and Figure 10.30 respectively. Zero NR\$ appears the norm so sudden increases for CSS *Neuse* (2008-2010), and Fort Fisher Historic Site (2014-2016) are transformative events and change patterns could be *complex* by comparison to Figure 10.7. For CSS *Neuse* the almost \$3.0 million NR\$ enabled its move finally into a controlled environment, as public and professionals had been advocating for since its recovery almost 60 years previously.

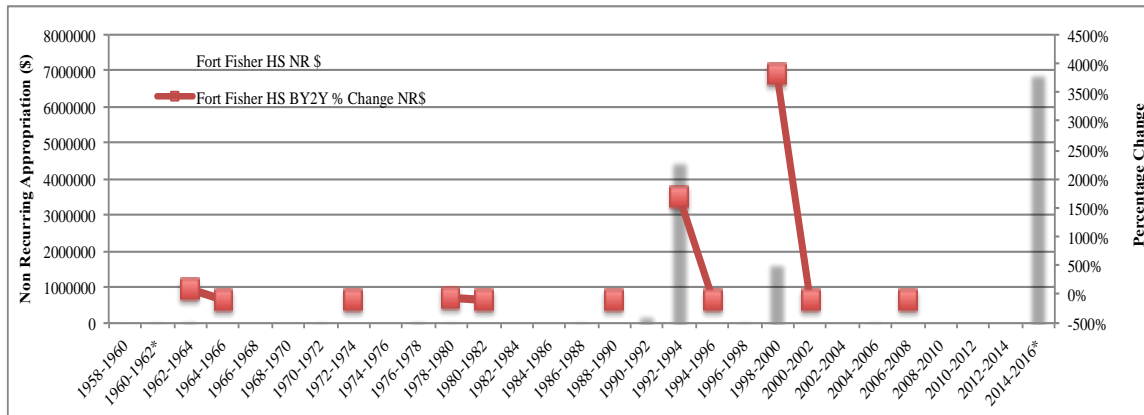


FIGURE 10.29. Time series for biennial year-to-year percentage change in non-recurring appropriations (NR\$) for Fort Fisher Historic Site 1960-2016 (n=13.7 million). (Figure by author, data source: North Carolina Session Laws; NC A&H Biennial Reports 1960-2016).

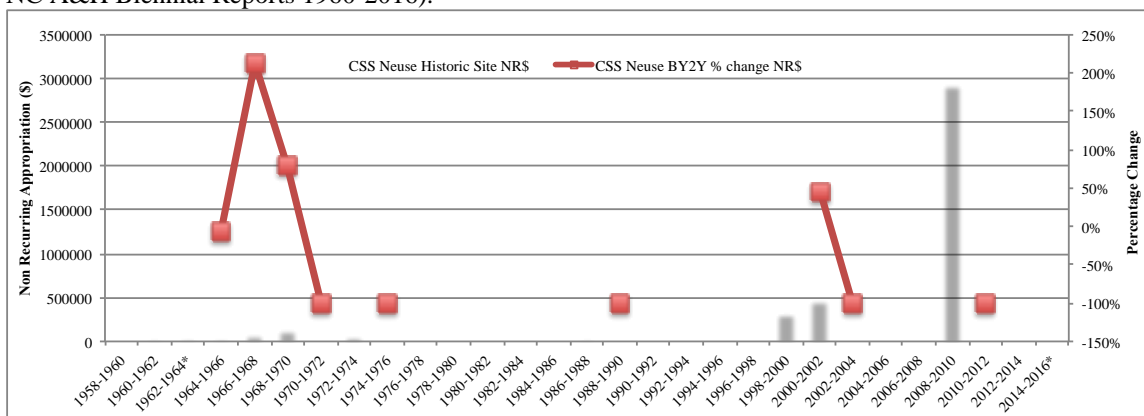


FIGURE 10.30. Time series for biennial year-to-year percentage change in non-recurring appropriations (NR\$) for CSS Neuse and Historic Site 1960-2016 (n=4.05 million). (Figure by author, data source: NC A&H Biennial Reports 1960-2016; NC Session Laws).

Time Series Change Patterns for Professional Interest: Google Scholar Publications

Indicator data for *professional interest* in the six UCH sites and ASAs included numbers of related publications found by keyword searches of *Google Scholar* by fiscal biennia, 1960 to 2016, as described in Chapter 9. Time series and return plots were made for BY2Y% change in numbers of relevant publications found by each keyword search.

Total Actual Numbers of Publications in Google Scholar

Researchers seeking the total number of publications in *Google Scholar* have found total number depends on search methodology. Orduna-Malea et al. (2015) estimated 170-175 million unique records. For this study to provide a base line for time series and return plot change

patterns for total numbers of publications in *Google Scholar* as at January 2018 the author did a search on “the” for 1960 to 2016. This found 50,948 million publications. For which time series and return plots (Figure 10.31) appear to be a *random* change pattern compared to Figure 10.5. By Dooley and Van de Ven’s matrix model (Table 10.12) a *random* change pattern indicates a system with high dimensionality (many variables) and no or linear interactions between variables.

Total Actual Numbers of Publications for Six UCH Sites in *Google Scholar*

The time series change pattern for combined numbers of UCH site related publications appears *random* (Figure 10.32). The return plot could be a *chaotic* by comparison with Figures 10.6. By Dooley and Van de Ven’s matrix model (Table 10.12) a *chaotic change* pattern indicates a system with low dimensionality (few variables) and nonlinear interactions between them.

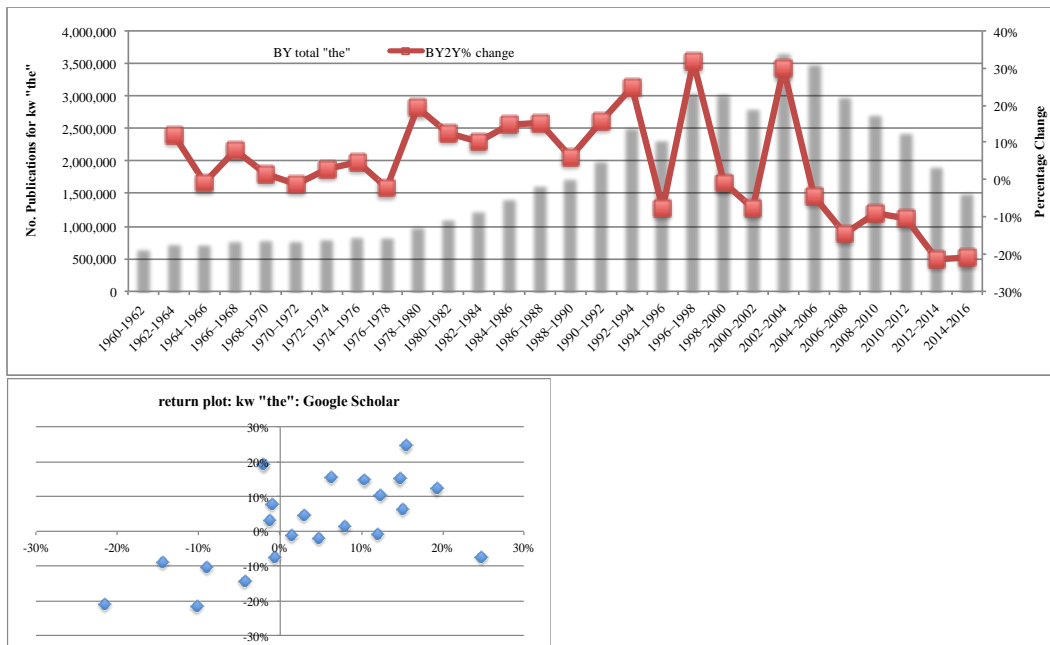


FIGURE 10.31. Time series (above) and return plot (below) for biennial year-to-year percentage changes in number publications in *Google Scholar* for keyword search on “the” (n= 50.948 million). (Figure by author, data Source: *Google Scholar* (January 2018)).

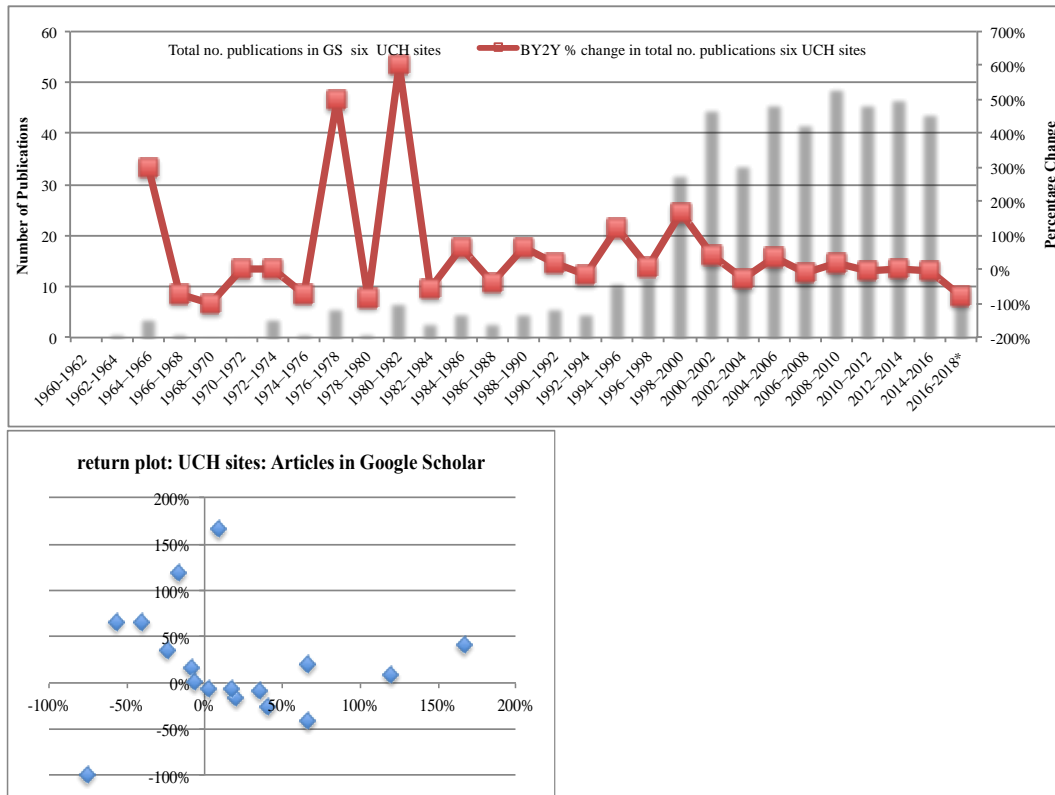


FIGURE 10.32. Time series (above) and return plot (below) for biennial year-to-year percentage change in number publications in *Google Scholar* for keyword search for all UCH sites (n=469). (Figures by author, data source: *Google Scholar* (April 2018)).

Total Actual Numbers of Publications for Six ASA Sites in *Google Scholar*

For ASAs the BY2Y% time series (Figure 10.33) appears a *random* change pattern, but the return plot has a *chaotic* change pattern, in comparison to Figures 10.5 and 10.6. By Dooley and Van de Ven Matrix Model (Table 10.12) a *chaotic change* pattern indicates a system with low dimensionality (few variables) and nonlinear interactions between them.

Actual Numbers of Publications for Six UCH Sites in *Google Scholar*

BY2Y% change in actual numbers of publications found in *Google Scholar* for the six UCH sites are plotted separately in Figure 10.34. Sufficient data for *Modern Greece* (n=38), *CSS Neuse* (n=67), and *Queen Anne's Revenge* (n=250), were found for separate time series and return plots for each (Figures 10.35, 10.36, 10.37).

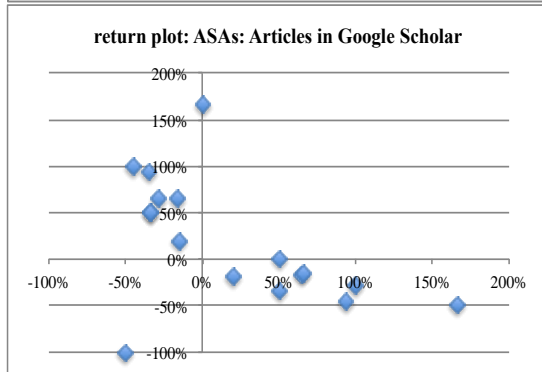
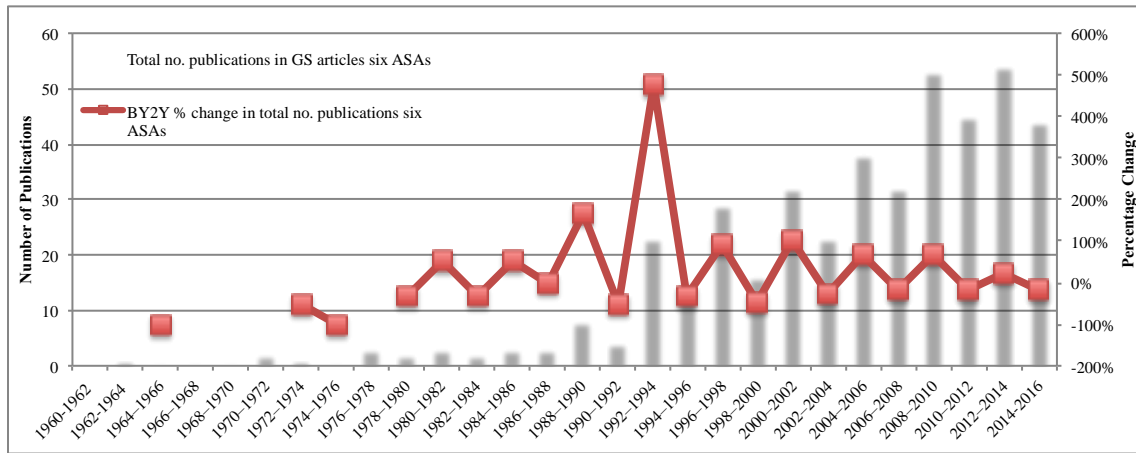


FIGURE 10.33. Time series (above) and return plot (below) for biennial year-to-year percentage change in number publications in *Google Scholar* for keyword search for all ASAs sites (n=444). (Figure by author, data source: *Google Scholar* (April 2018)).

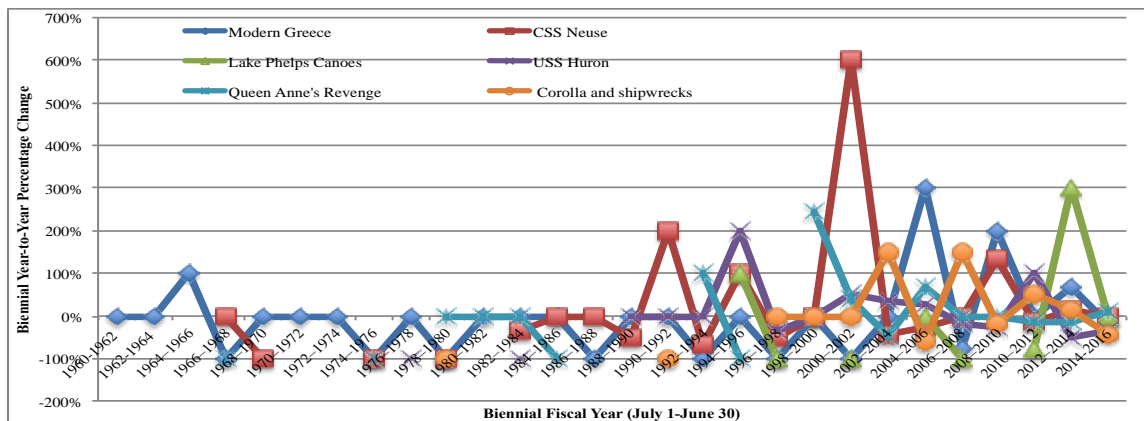


FIGURE 10.34. Time series for biennial year-to-year percentage change in number publications in *Google Scholar* for keyword search for six UCH sites (n=469). (Figure by author, data Source: *Google Scholar* (April 2018)).

MODERN GREECE: NUMBERS OF PUBLICATIONS IN GOOGLE SCHOLAR

The *Modern Greece* times series change pattern appears to be *random* but the return plot (Figure 10.35) could be *chaotic* by comparison to Figure 10.6. By Dooley and Van de Ven's

matrix model (Table 10.12) a *chaotic change* pattern indicates a system with low dimensionality (few variables) and nonlinear interactions between them.

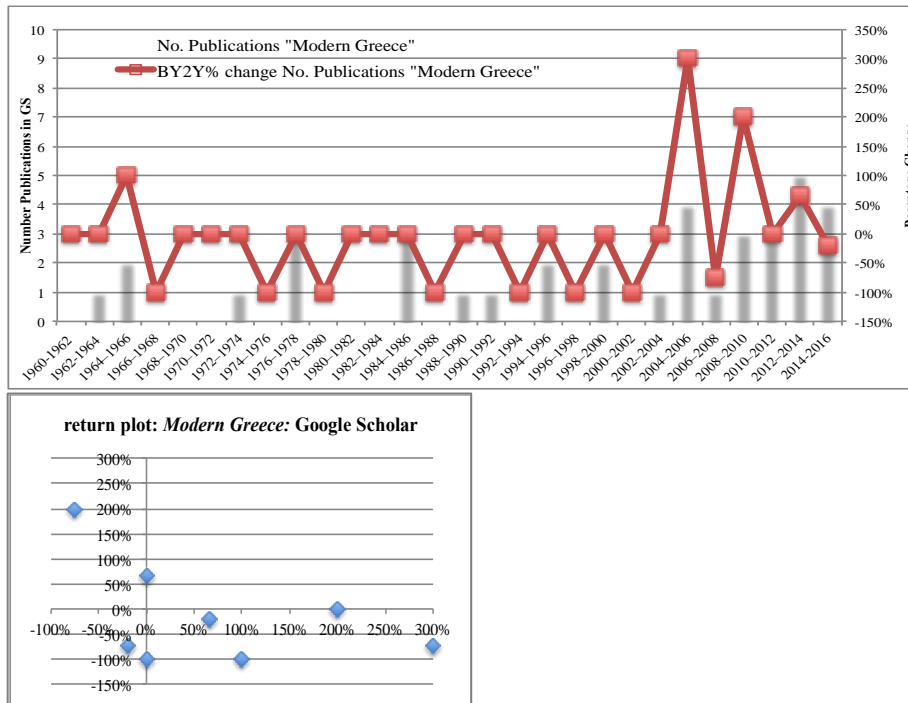


FIGURE 10.35. Time series (above) and return plot (below) for biennial year-to-year percentage change in number publications in *Google Scholar* for keyword search for *Modern Greece* (n=38). (Figure by author, data source: *Google Scholar* (April 2018)).

CSS *NEUSE*: NUMBERS OF PUBLICATIONS IN *GOOGLE SCHOLAR*

CSS *Neuse* times series plot change pattern appears *random* but the return plot (Figure 10.36) could be *chaotic* by comparison to Figure 10.6. By Dooley and Van de Ven’s matrix model (Table 10.12) a *chaotic change* pattern indicates a system with low dimensionality (few variables) and nonlinear interactions between them.

QUEEN ANNE’S REVENGE: NUMBER OF PUBLICATIONS IN *GOOGLE SCHOLAR*:

Change pattern for *Queen Anne’s Revenge* appears *periodic* prior to discovery but then *random* (Figure 10.37). By Dooley and Van de Ven’s matrix model (Table 10.12) a *periodic change* pattern indicates a system with low dimensionality (few variables) and no interaction or

linear interactions between them. A *random* pattern indicates a system with high dimensionality (many variables) and no or linear interactions between them.

Actual Numbers of Publications for Six ASAs Sites in *Google Scholar*

For ASA's BY2Y% change in actual numbers of publications found in *Google Scholar* are plotted separately in Figure 10.38. Insufficient data was found for return plots.

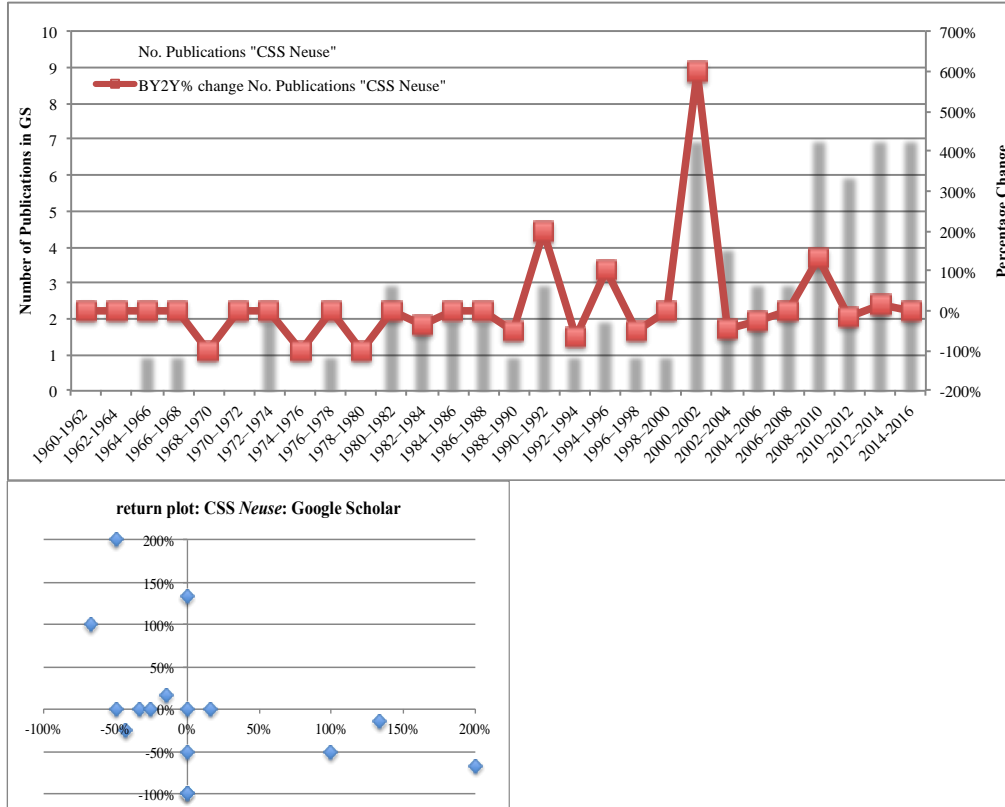


FIGURE 10.36. Time series (above) and return plot (below) for biennial year-to-year percentage change in number publications in *Google Scholar* for keyword search for *CSS Neuse* (n=67). (Figure by author, data source: *Google Scholar* (April 2018)).

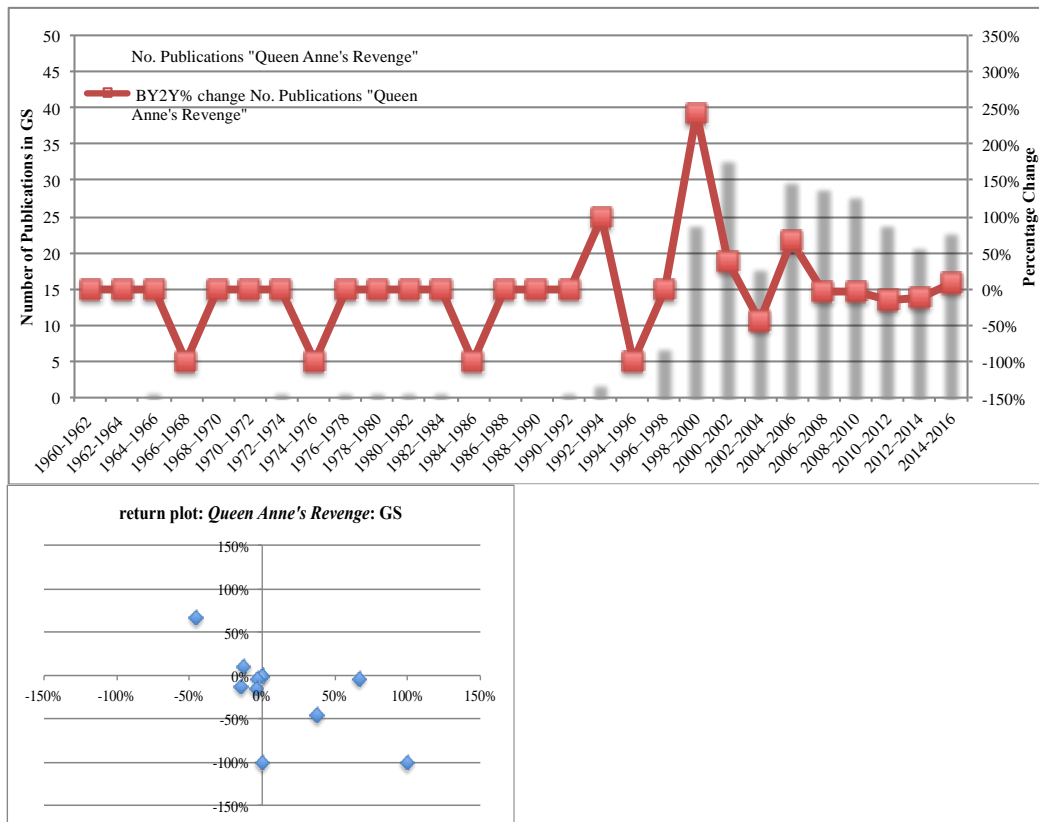


FIGURE 10.37. Time series (above) and return plot (below) for biennial year-to-year percentage change in number publications in *Google Scholar* for keyword search for *Queen Anne's Revenge* (n=250). (Figure by author, data source: *Google Scholar* (April 2018)).

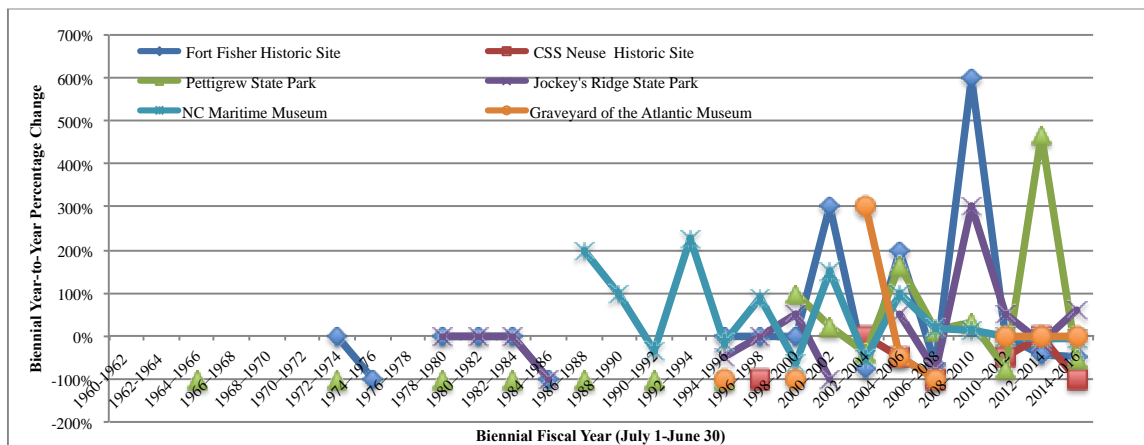


FIGURE 10.38. Time series for biennial year-to-year percentage change in number publications in *Google Scholar* for keyword search for six ASA sites (n=444). (Figure by author, data source: *Google Scholar* (April 2018)).

Time Series Change Patterns for Professional Interest: A&H/OSA/UAB Bibliography.

As described in Chapter 9, indicator data for *professional interest* in the six UCH sites, included numbers of references found for each site in the *North Carolina Bibliography Underwater Archaeology* of (NC A&H/OSA/UAB 2016). No references for ASAs were found.

Actual Numbers All References in 2016 Bibliography

The change pattern for BY2Y% change time series and return plot (Figure 10.39) for dated references in the 2016 *Bibliography* appears *random* by comparison to Figure 10.5. By Dooley and Van de Ven’s matrix model (Table 10.12) a *random* pattern would indicate a system with high dimensionality (many variables) and no or linear interactions between them.

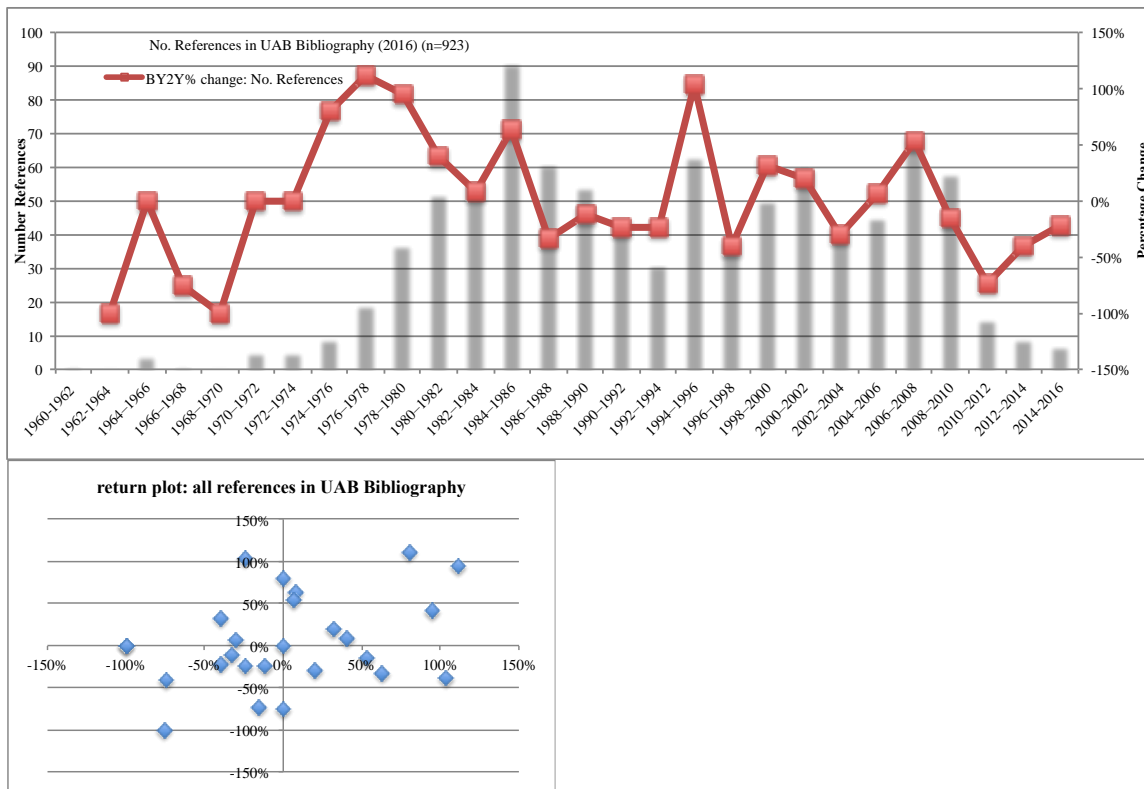


FIGURE 10.39. Time series (above) and return plot (below) for biennial year-to-year percentage change for all references in 2016 *Bibliography*, (n=923). (Figures by author, data source: 2016 *Bibliography* (NC A&H/OSA/UAB 2016)).

Numbers of References for UCH Sites in 2016 *Bibliography*

Only Lake Phelps canoes and *Queen Anne’s Revenge* had enough references in the 2016 *Bibliography* for constructing BY2Y% change time series and return plots. For Lake Phelps canoes the change pattern (Figure 10.40) appears *periodic* by comparison to Figure 10.4. For *Queen Anne’s Revenge* the change pattern (Figure 10.41) appears to be *random*. By Dooley and Van de Ven’s matrix model (Table 10.12) a *periodic* pattern would indicate a system with low dimensionality (few variables) and no or linear interactions between them. A *random* pattern would indicate a system with high dimensionality (many variables) and no or linear interactions between them.

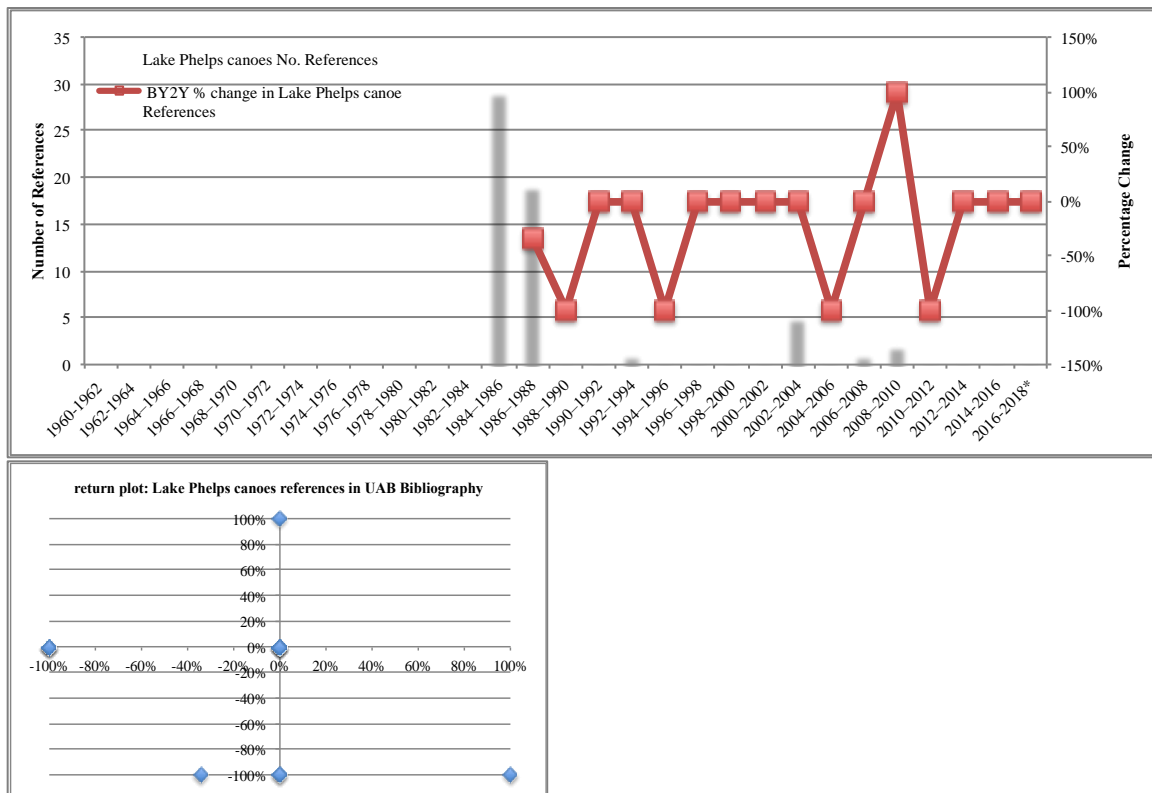


FIGURE 10.40. Time series (above) and return plot (below) for biennial year-to-year percentage changes in number references for Lake Phelps canoes in 2016 *Bibliography* (n=57). (Figure by author, data source: 2016 *Bibliography* (NC A&H/OSA/UAB 2016)).

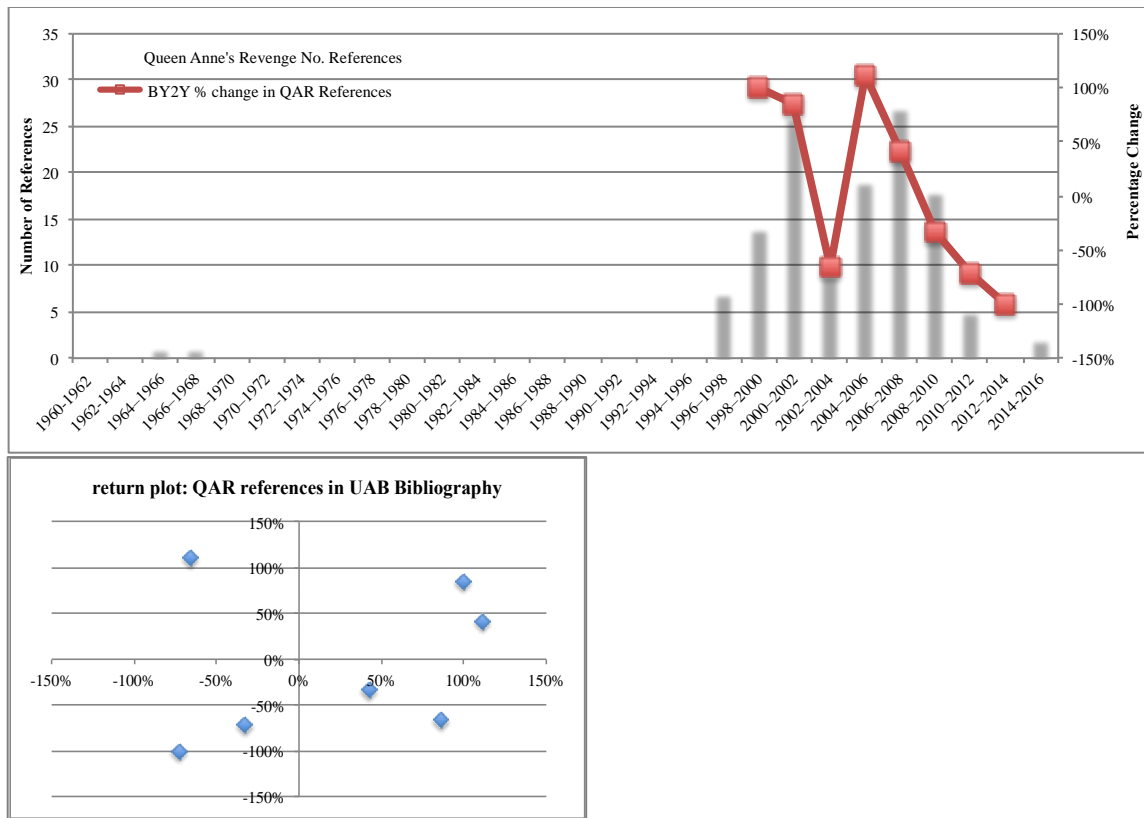


FIGURE 10.41. Time series (above) and return plot (below) for biennial year-to-year percentage changes in number of references for *Queen Anne's Revenge* in 2016 (n=129). (Figure by author, data source: 2016 *Bibliography* (NC A&H/OSA/UAB 2016)).

Discussion

Two null hypotheses tested by time series analyses of indicator data for *players' interest* in six UCH sites and ASAs were: 1) there is no change in levels of players' interests over time, and 2) that it is not possible to visually identify the type of change over time in levels of *players' interests*. Time series analyses included plotting BY2Y% change from which it was evident that *players' interest* did change over time. Therefore, null hypothesis (1) was rejected in all cases. It was possible to visually identify BY2Y% change patterns from time series and return plots for the six UCH sites and for ASAs. Therefore, null hypothesis (2) also was rejected.

Types of change pattern in time series and return plots for interest indicator data were visually identified by comparison with known change patterns (Figures 10.4-10.7) after Dooley and Van de Ven (1999) and Haynes (2008). BY2Y% change patterns for *public, political, and*

professional interest indicator data, as found for North Carolina, A&H totals, the six UCH sites and ASAs are summarized in Tables 10.13, and 10.14, and Figure 10.42.

	Public Reading	Public Visiting	Political Legislation	Political Appropriations	Professional Google Scholar	Professional Bibliography
UCH Site						
<i>Modern Greece</i>	<i>complex</i>				<i>random (chaotic)</i>	
<i>CSS Neuse</i>	<i>complex</i>			<i>complex</i>	<i>random (chaotic)</i>	
Lake Phelps Canoes	<i>complex</i>				<i>random</i>	<i>periodic</i>
<i>USS Huron</i>	<i>complex</i>				<i>random</i>	
<i>Queen Anne's Revenge</i>	<i>complex</i>			<i>random (RS, all); complex (NRS)</i>	<i>random</i>	<i>random</i>
Corolla shipwrecks (for GBW wreck)	<i>random</i>					
ASA						
Fort Fisher HS	<i>random</i>	<i>chaotic</i>		<i>complex</i>		
CSS Neuse HS	<i>random</i>	<i>random</i>		<i>complex</i>		
Pettigrew SP	<i>random (chaotic)</i>	<i>random</i>		<i>random</i>		
Jockey's Ridge SP	<i>random</i>	<i>random</i>		<i>random</i>		
NC Maritime Museum	<i>random</i>	<i>random</i>		<i>random</i>		
Graveyard of the Atlantic Museum	<i>complex</i>	<i>random</i>		<i>random</i>		

TABLE 10.13. Summary of change patterns visually identified by author from time series and return plots for biennial year-to-year percentage changes in interest indicator data for six UCH sites and Six ASAs. (Table by author).

Interest Indicator change plots	No. random	No. complex	No. chaotic	No. periodic	Total
NC & A&H (n=5)	5	0	0	0	5
UCH Sites (n=17)	9	7	0	1	17
ASAs (n=24)	17	6	1	0	24
Totals	31	13	1	1	46
Percentage	68	28	2	2	100
Interest Indicator change plots	% random	% complex	% chaotic	% periodic	
NC & A&H (n=5)	100	0	0	0	100
UCH Sites (n=17)	53	41	0	6	100
ASAs (n=24)	71	25	4	0	100

TABLE 10.14a. Total numbers and percentages of change patterns visually identified from interest indicator data time series and return plots for North Carolina, A&H, UCH sites and ASAs. (Table by author).

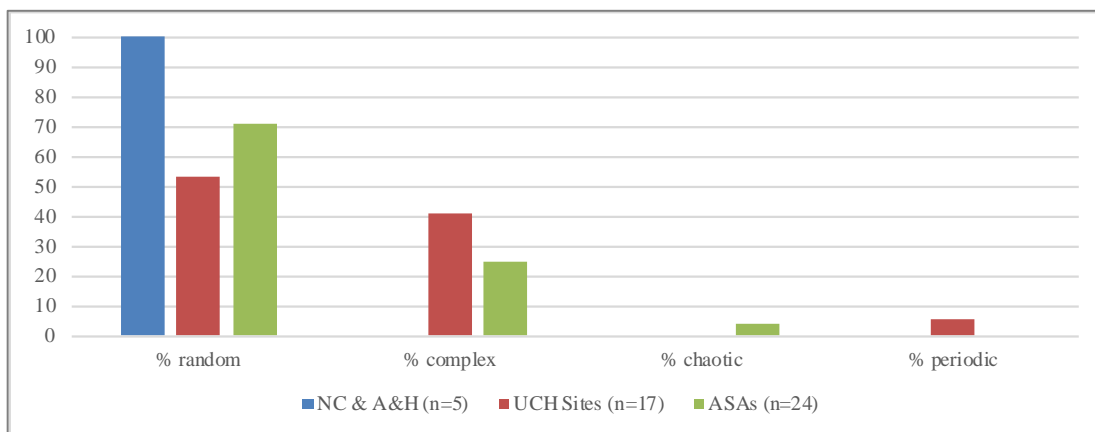


FIGURE 10.42. Types of change patterns identified for all North Carolina, A&H, UCH Sites and ASAs data, as percentages of total number of change patterns identified for each. (Figure by author, data source: Tables 14a).

For North Carolina, A&H, UCH sites, and ASAs, sufficient interest indicator data were found by the author to construct 46 time series and return plots (Figures 10.8 to 10.41). From which dynamic systems change patterns were visually identified by comparison with model plots (Figures 10.5-10.8). For the change patterns (Figures 10.8 to 10.41) thus visually identified, from Dooley and Van de Ven's (1999) dynamic systems matrix model (Table 10.12), the dimensionality of the causal systems (many or few variables) and of interactions between variables (no interaction or linear interaction, or nonlinear interactions) were inferred. From the 46-time series and return plots change patterns visually identified were: *random* 31 (68%), *complex* 13 (28%), *chaotic* 1 (2%), and *periodic* 1 (2%) (Table 10.14). These were equated by the author with *traditional* or *complex* management systems (Table 10.14a).

		Dimensionality of Causal System		Change Patterns Identified	Management System Type/Approach
		Few Variables	Many Variables	All NC A&H UCH (n=46)	
Nature of Interactions between Causal Factors	No Interaction or Linear Interaction	Periodic	Random	Periodic: 2% Random 68%	Traditional
	Non Linear Interaction	Chaotic	Complex	Chaotic: 2% Complex 28%	Complex

TABLE 10.14b. Change patterns visually identified from interest indicator data time series for North Carolina, A&H, UCH sites and ASAs, equated with traditional or complex management systems. (Table by author, after Dooley and Van de Ven 1999).

Periodic and *random* change patterns were equated with *traditional management* systems (Table 10.14b). As defined by Geyer and Rihani (2010:5) these systems would be stable, ordered, and with predictable linear or no relationships between cause and effect when implementing public policy over time. For *random* systems, there may be so many variables that interactions are not possible to identify, there may be no interactions, or interactions may not be discernible at least in the short term. Over longer time periods, however, some predictability may emerge. For example, year-to-year changes in appropriation levels may not be possible to predict, but it could be possible to predict there is likely to be approximately the same as the

current year. Over the long-term (as over decades) patterns might emerge that make it possible to predict that there will be funding - or no funding. Of the change patterns visually identified for interest indicator data as analyzed for this study the majority (68%) were *random*.

Chaotic and *complex* change patterns were equated with *complex management systems* (Table 10.14b). These are characterized as unstable, dynamic, unpredictable, and non-linear in interactions between variables (Geyer and Rihani 2010) – at least in the short term. In a *chaotic system* there are few variables but nonlinear interactions between variables, thus it might be possible to predict that an event - such as a hurricane, or publications in *Google Scholar* relating to UCH sites will happen but not to predict when.

In a *complex system* there are many variables in the system and so many nonlinear interactions between them that in the short term a change pattern may visually appear similar to a *random* one. In the long term, however, major transformative events - such as discovery of an iconic shipwreck – may be evident in the time series pattern as a huge increase. This reflecting for example, such a large increase in *public interest* in the UCH site that flattening effect of other variables are overcome at least for a short time. Following the transformative event the system settles back down again as evidenced by a flatter change pattern (Figure 10.10).

Complex Adaptive Systems (CAS) Model

To determine if the six UCH case study sites, from a public management perspective were *complex adaptive systems* (CAS), data (as described in Chapters 4 through 9) were analyzed against Rhodes et al. (2011) model “6+4” CAS framework. The null hypothesis tested was that the six UCH sites, as A&H managed public projects are not *complex adaptive systems*.

A *complex adaptive system* (CAS) is *complex* because of its heterogeneity and diversity; *adaptive* due to its capacity to alter, change and learn from experience; and *a system* because it

consists of a set of connected, interacting or interdependent things including people as agents (Grobman 2005:360). By Rhodes et al. (2011) “6+4” framework for characterizing a public agency project as a CAS six *elements* and four *behaviors* all have to be demonstrated. The concepts embodied in these *elements* and *behaviors* were described in Chapter 2 (Methods and Models) of this study but are summarized below and in Figure 10.43.

The six CAS *elements* are: *system*, *environmental factors*, *environmental rules*, *agents*, *processes and outcomes*. A public policy project as a *system* may be identified by its boundaries including physical, temporal, organizational, professional, financial, policy domain (as context), and purpose. A system’s *environment* can include anything that influences *processes* undertaken and the *outcomes* of those *processes* (Rhodes et al. 2011:117). The *environment* includes *factors*, *rules*, and *agents* both within the *system* (*endogenous environment*) and outside it (*exogenous environment*).

The four CAS *behaviors* to be demonstrated are *path dependency*, *bifurcation*, *adaptation*, and *emergence*. *Path dependency* refers to characteristics of the system as initial conditions (for example, behaviors, values, and organizational memory). *Bifurcation* is dynamic behavior similar to punctuated equilibrium where a state of semi-equilibrium is maintained until disrupted by a transformative event, after which a new state is adopted and new equilibrium established. *Adaptation* are changes made by agents in response to actions of other agents, or changes in the environment. *Emergence* relates to new but unpredicted properties of a system created as a result of actions over time and can be a vision or “driver for change” developed through agent interactions over time (Rhodes et al. 2011:14-15, 152, 155-160).

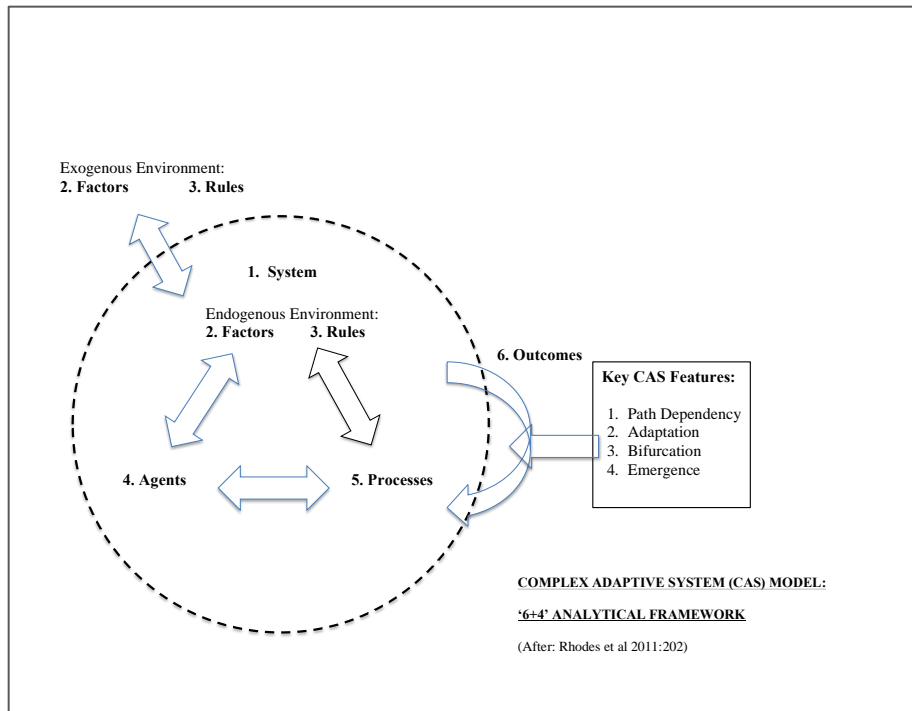


FIGURE 10.43. Complex Adaptive System Model (CAS): “6+4 Analytical Framework”. (Figure by author, after Rhodes et al. (2011:202)).

Systems

System boundaries were identified by the author for each of the UCH sites as public projects (Table 10.15). Some *boundaries* were common to all, others were local to each UCH site. *Geographically* all six UCH sites were in the coastal region of North Carolina. *Temporally* all were undertaken at various times since the early 1960s. *Organizationally* all were managed by A&H professionals. *Financially* all had received at least some state funding, mainly as recurring appropriations (R\$) for permanent state employees. By *policy domain* all were underwater sites in North Carolina state waters and therefore subject to federal and state legislations and public policies for UCH. In all cases the overall A&H purpose included both preservation and access to enable use of UCH as an educational and economic resource.

CAS: ELEMENT:	SYSTEM	UCH SITES					
BOUNDARY TYPE:		<i>Modern Greece</i>	<i>CSS Neuse</i>	Lake Phelps Canoes	USS <i>Huron</i>	<i>Queen Anne's Revenge</i>	"George Brown Wreck"
Geographical	State	NC	NC	NC	NC	NC	NC
	Coastal Region	OBX	IBX	OBX	OBX	OBX	OBX
	County	New Hanover	Lenoir	Washington/Tyrell	Dare	Carteret	Corolla
	City/Town	Wilmington	Kinston		Nags Head	Beaufort	Hatteras
Temporal	Date of wreck (s)	1862	1864	c. 4000 to 500 BP	1877	1718	16-17th century?
	Project date range	1962-present	1965-present	1985-present	1991 - present	1996-present	2010-present
	Project complete	No	No	No	Yes	No	No
Organizational	Public Agency	A&H	A&H	A&H	A&H	A&H	A&H
	Professional Agents	A&H	A&H	A&H	A&H	A&H	A&H
Financial	State RS (A&H staff)	Y	Y	Y	Y	Y	Y
	State NRS (operations)	Y	Y	N	N	Y	N
	Grants \$	Y	N	N	Y	Y	Y
	Non-Profits \$	Y	Y	N	N	Y	N
Policy Domain	NC underwater sites	Y	Y	Y	Y	Y	Y
Purpose	Preservation	Y	Y	Y	Y	Y	Y
	Access (public)	Y	Y	Y	Y	Y	Y

TABLE 10.15. CAS Element: System boundary characteristics of six UCH sites identified by this study. (Table by author – note: Brown should be Browne, and its location is in Currituck County not Corolla).

Environmental Factors

Environmental factors identified as pertinent to system environments (*exogenous* and *endogenous*) that influenced decisions made and actions taken by agents within the system for each of the six UCH sites are summarized in Table 10.16.

CAS: ELEMENT:	ENVIRONMENT	UCH SITES					
FACTOR TYPE:		<i>Modern Greece</i>	<i>CSS Neuse</i>	Lake Phelps Canoes	USS <i>Huron</i>	<i>Queen Anne's Revenge</i>	"George Brown Wreck"
Contextual	Social Demographic	Y	Y	Y	Y	Y	Y
	Economic	Y	Y	Y	Y	Y	Y
	Political	Y	Y	Y	Y	Y	Y
	Physical/Environment	Y	Y	Y	Y	Y	Y
	Technological	Y	Y	Y	Y	Y	Y
	Legal	Y	Y	Y	Y	Y	Y
	Values	Y	Y	Y	Y	Y	Y
Agents	Functional capacity	Y	Y	Y	Y	Y	Y
	Reputation	Y	Y	Y	Y	Y	Y
	Power	Y	Y	Y	Y	Y	Y

TABLE 10.16. CAS Element: Types of environment factors (exogenous and endogenous) identified by author as influencing processes (actions) taken by A&H agents in each of UCH site Projects. Y=yes, Factor Influenced Actions Taken. (Table by author, note: Brown should be Browne).

Social Demography Factors

The changing *demography* of the *resident population* of North Carolina and its Coastal region (as described in Chapter 4) is part of the context or *exogenous* environments for each of the six UCH sites, albeit in different ways. For example, *Modern Greece* and Fort Fisher Historic Site are located near the densely populated urban area of Wilmington in New Hanover

County. Lake Phelps, in which the canoes were found, is in Washington County which is one of the least populated coastal counties.

Economic Factors

Since the early 20th century North Carolina has been a popular tourist destination. Visits made to historic sites and museums are often critical to local economies and are thus integral parts of a UCH site system, as both *exogenous* and *endogenous economic* factors. For example, for Kinston in Lenoir County, the CSS *Neuse* Historic Site and then the CSS *Neuse* Interpretation Center were both envisaged as critical for the recovery of the town after economic and hurricane devastations of the 1990s.

North Carolina also has a *visiting population*, many of whom are also its *residents*. In 2015 there were 54.6 million visits made across the state for various reasons (NC VP 2015). Approximately 50% of which by North Carolina residents. The majority of all visits in the state were for leisure, with up to 10% to locations connected to history. Approximately 1% were scuba diving or snorkeling activities but were more concerned with fishing than with shipwrecks (Figure 7.22). In 2010-2011, 38 state attractions in the Coastal Plain received about 8.5 million visits; approximately 43% of all visits made state wide (Figure 7.23) (NC PED 2012). Of all visits made approximately 80% of visitors were white (Figure 7.21).

Political Factors

Political factors (exogenous) for all UCH projects include North Carolina's state government framework, and organizational framework of its public agency A&H. The existence, roles, duties, and responsibilities of A&H are as established and enabled by legislations passed by the North Carolina's General Assembly since 1903. Appropriations to A&H, including for UCH, depend on the balance of power in the General Assembly and other needs in state. For

example, after the hurricanes of 1999 culminating in the Hurricane Floyd disaster, the legislature recalled funding appropriated for many A&H projects, including QAR's as the funds were needed elsewhere. Thus, statewide political decisions can be critical *endogenous environment factors* directly affecting resources available for a particular UCH site.

Legal Factors

Issues of ownership, rights of use, and responsibility for protection and preservation have been primary legal factors of both *exogenous* and *endogenous environments* in relation to UCH sites in North Carolina. Over years federal and state legislations have aimed to establish state ownership and responsibilities in relation to UCH (as described in Chapter 8). North Carolina's first state legislation relating specifically to underwater sites was the 1967 *Act to Establish Ownership of All Bottoms in Certain Waters and to Establish Procedures for Conducting Salvage of Abandoned Shipwrecks and other Underwater Archaeological Sites*" (NC 1967). The bill was introduced following ownership disputes between a private salvage company and A&H, over *Modern Greece* and other Civil War shipwrecks (Lawrence 2011). In the case of CSS *Neuse*, it took almost two years (1962-1964) for local ownership disputes to be resolved with the vessel becoming responsibility of A&H (A&H 1964:59-60). State shipwreck 31CR314, *Queen Anne's Revenge*, located within three miles of the coast in state waters belongs to the state of North Carolina. For this site, *legal* issues have arisen in relation to copyright of digital images, documentary film rights, and replicas (Woolverton 2015a, b; Burke 2019).

Technological Factors

Technological factors as *environmental (exogenous and endogenous)* factors have included wide-ranging technological advances in many disciplines (from diving to digital imaging) since the early 1960s. These have enabled a widening range of interested people to

access UCH in North Carolina and increased options for its conservation. For example, when *Modern Greece* and *CSS Neuse* were recovered in the early 1960s, its recovery was a basic salvage operation and initial conservation of artifacts was very much by trial and error. Thirty-five years later at *Queen Anne's Revenge* site geoscientists working with A&H archaeologists have used marine technologies and equipment to investigate sedimentation processes over the site. This has enabled A&H archaeologists and conservators to understand the dynamic nature of the site and threats to its long-term preservation in situ. By which the decision was made in 2006 to implement full recovery of the site and it's remains to be conserved ex situ as resources were available. In the meantime, active preservation measures in situ would be taken (Wilde-Ramsing and Lusardi 1999; Wilde-Ramsing and Rodrigez 2008; Watkins-Kenney et al. 2015).

Physical Environment Factors

North Carolina's natural coastal system is dominated by water (ocean, estuaries, lakes, and rivers) and by the sedimentary processes in each (Riggs et al. 2011). The extent to which UCH in situ is preserved or destroyed depends on complex and site-specific interactions between the material of the remains and their physical and biogeochemical burial environment over time. Critical for preservation is sufficient depth of undisturbed sediment cover to provide physical protection and an anaerobic environment to reduce rates of deterioration (Ward et al. 1999; Gregory et al. 2012).

Coastal North Carolina is characterized by environmental extremes by which it is both built and destroyed. Major storm events (including hurricanes) bring changes to the coastal landscape that can be sudden and catastrophic. Change also can be gradual and barely perceptible as under the influence of climate change and sea level rise, but "change is the only constant within the system" (Riggs et al. 2011:2,1-4; 24-31).

Sediment accumulation and its stability are key factors of the *endogenous environment* of a particular UCH site and can determine its degree of preservation, or destruction. Given the natural coastal system of North Carolina, however, sedimentation over UCH sites can be repeatedly removed by storms generating waves sufficient to disturb bottom sediments. Such events can lead to the re-exposure or discovery of UCH remains – as was the case for *Modern Greece* after the Ash Wednesday storm of March 1962, and *Queen Anne's Revenge* since 1996.

Value Factors

UCH as defined for this study are submerged physical remains of the past that have *value* in the present as material cultural heritage that is worth keeping. Such remains may be valued by different people for different reasons including for their scientific, historic, archaeological, educational, and economic use (Appelbaum 2007:86-114; Kapelouzou 2012:180). For this study levels of *interest* of three groups of people (*public, political, and professional*) in North Carolina, in remains of the past and UCH in general, and for six UCH sites in particular, were investigated as measures of their relative *value* to each group and to understand how these *values* may have influenced *conservation actions* taken.

PUBLIC VALUES

As measures of *value* in the *exogenous* and *endogenous environments* of the six UCH sites, data collected for levels of *public interest* were for *reading public interest* numbers of relevant articles found by keyword searches of the *America's News Historic and Current* (ANHC) online database, and for *visiting public interest* numbers of visits to ASAs in 2010-2011 (NC PED 2012) (as described in Chapter 7).

For *reading public interest*, in all North Carolina articles (approximately 6.35 million) keyword *history* was found in approximately 8% of articles, *museum* in 2%, *archaeology* in

0.06%, *scuba* in 0.06%, and *cultural heritage* in 0.03%. Keyword search on “*underwater cultural heritage*” found zero articles. For *archaeology* and *underwater* 475 articles were found. For which in 1997, there was a 900% increase in the number of articles for this combination of keywords; the year discovery of “*Queen Anne’s Revenge*” was announced. For combinations of *history* with other keywords the most articles found were for *history* with *public*, *Civil War*, *cost*, *education*, or *site*.

By numbers of visits to state attractions in 2010-2011, there was most *visiting public interest* in Jockeys Ridge State Park (over 1.6 million visits) and least in CSS *Neuse* Historic Site (approximately 10,000). Of all historic sites there was most interest in two associated with the Civil War – Fort Fisher Historic Site and Fort Macon. New Hanover County received about 35% of all visits to all attractions in OBX counties.

As *value* factors in the *endogenous environments* of the six UCH sites there was most reading *public interest* in *Queen Anne’s Revenge* and least in USS *Huron*. By numbers of visitors to ASAs there were most *visiting public interest* in Fort Fisher Historic Site (ASA for *Modern Greece*), and least in CSS *Neuse* Historic Site (ASA for CSS *Neuse*).

POLITICAL VALUES

Relative levels of *political interest* (as indicated by numbers of legislations and amounts of appropriations) were investigated as factors in the *exogenous* and *endogenous* environments for the six UCH sites (as described in Chapter 8). Assuming levels of *state appropriations* are indicators of political *value*, by this measure A&H generally from 1959-1960 to 2013-2014, received 0.16% of the total NC General Fund (GF) over this time. Between 1960 and 2014, its historic sites section received approximately 33% of A&H’s total, Museum of History about 10%-20%. The appropriation for Office of State Archaeology, with responsibility for all

archaeology and conservation in relation to all UCH sites, has been less than 5% of A&H's budget since 2003/2004.

In 2010-2011, levels of appropriation for historic sites were approximately \$0.23 million per site (1%), and for museums approximately \$1.18 million per site (4%). Three maritime museums (Beaufort, Southport and Hatteras) and a commission (Roanoke Festival Island Park) received in total 12% (\$3.75 million) of DCR's total appropriation, of which 55% went to Roanoke Festival Park.

By numbers of legislations as indicators of *political interest* in UCH of approximately 29,000 Session Laws listed on North Carolina's state government website for 1959/1960 to 2016/2017, the author found just 25 that related directly to only three of the six UCH sites: 14 (56%) to *Queen Anne's Revenge*, 8 (32%) to *CSS Neuse*, and 3 (12%) to *Modern Greece*. These three UCH sites were only ones to receive appropriations – in total approximately \$20 million in R\$ from 1960/1961 to 2016/2017. This was approximately 3% of A&H's total approximate appropriation of \$700 million over the same period. Of the \$20 million R\$, less than 1% went to *Modern Greece* over 16 years, about 77% went to *CSS Neuse* over 54 years, and 22% to *Queen Anne's Revenge* over 21 years.

PROFESSIONAL VALUES

Professional interest in history and remains of the past as value factors in the *exogenous environment* for the six UCH sites were evidenced by analysis of three A&H programs: the *North Carolina Highway Historic Marker Program* (NC HHM), North Carolina sites on the *National Register of Historic Places* (NC NRHP 2016), and UCH sites listed in 2011 *Sites Database* (NC A&H/OSA/UAB 2011). By critical discourse analysis of databases for each of

these programs, data on levels of *professional interest* by *location*, *theme*, and for some change over time, were collected (as described in Chapter 9).

Statewide, 43% of 1,580 historic markers were in Coastal Plain counties, with 23% in OBX counties, of which the most (63) were in New Hanover County. By theme, 50% of all historical highway markers had a *military* theme, of which 65% related to the Civil War. Of the *military* themed markers 93% were in Coastal Plain counties, with most being in New Hanover and Dare counties. Just over 7% of the total number had a *maritime* theme with most of these being in Dare (13), New Hanover (12) and Carteret (10). By date, most highway markers were cast during the 1950s, while most with a *maritime* theme during the 1960s.

Of 2,975 sites on the *North Carolina National Register for Historic Places* (NC NRHP 2016), 39% had a *people-place* theme, 1% a *military* theme, and 1% were *archaeological* sites. Thirty percent were in Coastal Plain counties, of which 60% were in IBX counties. A third of all sites on the NRHP by 2016, were listed in the 1980s.

Approximately 950 UCH sites in total were listed in the 2011 *Sites Database* (NC A&H/OSA/UAB 2011) of which 90% were in OBX counties, with most in New Hanover (163), Beaufort (150) and Dare (105) Counties. Approximately 64% were in the *economy* theme group, 24% were *places*, 7% *canoes*, and 5% *military*, as categorized by the author. Most of the *economy*, *place* and *military* themed UCH sites were in New Hanover, Dare, Brunswick and Beaufort counties. Approximately a third of all *canoes* found statewide were in Lake Phelps in Washington County. By body of water 62% of the total UCH sites listed in the *Sites Database* (2011) were in rivers and creeks, with most in the Cape Fear River system and Tar-Pamlico River systems. Approximately 33% of sites were in ocean side environments. Of UCH sites listed in the 2011 *Sites Database* most were first visited during the 1980s.

Professional interest as value factors in the endogenous environment for the six UCH sites were further evidenced by numbers of relevant publications found by keyword searches of *Google Scholar*, and numbers of references per site in the *Bibliography of North Carolina Underwater Archaeology* (NC A&H/OSA/UAB 2016). Conservation actions taken in each case also gives an indication of the relative *value* of each of the six UCH sites from a *professional interest* perspective (as described in Chapters 6 and 9). By these measures there has been most *professional interest* in *Queen Anne's Revenge* and least in Lake Phelps Canoes, CSS *Neuse*, and the "George Browne" Wreck.

Agents

In any public project or program as a CAS *Agents* are key elements as influencing factors in both its *exogenous* and *endogenous* environments (Rhodes et al. 2011:45-46). In the *exogenous environment* agents influence processes (actions) and outcomes of those actions. *Agents* also are responsible for actually implementing processes within a project's *endogenous environment*. In the cases of the six UCH sites investigated by the author, various *agents* were identified as influencing factors in both *exogenous* and *endogenous* environments (Table 10.17).

CAS: ELEMENT:	AGENTS	UCH SITES					
		<i>Modern Greece</i>	<i>CSS Neuse</i>	Lake Phelps Canoes	<i>USS Huron</i>	<i>Queen Anne's Revenge</i>	"George Brown Wreck"
Exogenous (partners)	Other Public Agencies	Y	Y	Y	Y	Y	Y
	Private for profit	N	N	N	N	Y	N
	Private Not for profit	Y	Y	N	Y	Y	N
	Volunteers (public)	Y	Y	N	Y	Y	Y
	Professionals	Y	Y	Y	Y	Y	Y
Endogenous (A&H)	Political	Y	Y	N	Y	Y	Y
	Professionals	Y	Y	Y	Y	Y	Y
	Management	Y	Y	Y	Y	Y	Y

TABLE 10.17. CAS Element: Agents in exogenous and endogenous environments of six UCH sites. (Table by author).

In each case for the six UCH sites there were *agents* in the *exogenous environment* who variously had organizational capability (skills, knowledge, and potential productive capability), reputation (ethics and professionalism), and power to influence actions of other agents in relation

to conservation decisions and actions. *Agents* in the *exogenous environments*, including at the time of “discovery”, were influential factors in launching each of the six UCH sites as an A&H project (as described in Chapter 6).

Since the early 1960s A&H staff have been agents involved with all UCH sites. In the six UCH case study sites A&H staff also have worked in various partnerships and collaborations with other *agents* in various organizations. For example, non-A&H *agents* for *Modern Greece* and *CSS Neuse* projects in the early 1960s included Navy divers and members of the North Carolina Confederate Centennial Commission (NC CCC), and particularly its chairman. In the mid-1980s for *Lake Phelps Canoes*, *agents* in place included the superintendent and staff at *Pettigrew State Park*. For *USS Huron* in 1991 there was: *public interest* as it was a popular dive site since the 1960s, *political interest* from the local community (town of Nags Head) and particularly the Head of Fire and Rescue, and *professional interest* through the thesis research by a student in ECU’s Maritime Studies Program (Friday 1988). From at least the early 1980s there had been *public* and *professional agents* interested in *Queen Anne’s Revenge* (Wilde-Ramsing and Carnes-McNaughton 2018). In the case of the “George Browne” Wreck by 2010 there was already local *public interest* in wrecks periodically exposed along Corolla Beaches, and particularly in this one since 2008 (Henry and Watkins-Kenney 2010). There was also local *political interest* from a powerful state senator recognizing the potential of the wreck to draw tourists and help local economies. There was general *professional interest* in documenting the wreck under the already established A&H’s Beach Wrecks program (as described in Chapter 6).

Once each of the six UCH sites became an A&H project, *agents* inside and outside of A&H were variously partners and participants undertaking *processes* to implement policy and to accomplish project objectives. Thus, they were part of each projects’ *endogenous environment*.

In all of the six UCH sites principal *agents* were *professional* employees of A&H but none of the work could have been done without participation of dozens, often hundreds, of others both through official and unofficial partnerships with many organizations and individuals.

Environmental Rules

Environmental *Rules* govern and determine actions of *agents* (Rhodes et al. 2011:12).

Rules may pre-exist a particular public project, but may also be created as a result of it.

Exogenous rules can include established legislation, public policy, regulations, organizational mission statements, strategic plans, bureaucracies, and hierarchies. *Endogenous rules* governing agent action in relation to a particular project could include their position descriptions and individual workplans, project management plans, and memorandum of agreements (MOAs) between project partners and individual agents, defining their various roles and responsibilities.

Exogenous and *endogenous* rules were found by this study to variously have determined agent actions in each of the six UCH sites as summarized in Table 10.18.

CAS: ELEMENT:	ENVIRONMENT	UCH SITES					
RULES		<i>Modern Greece</i>	<i>CSS Neuse</i>	Lake Phelps Canoes	<i>USS Huron</i>	<i>Queen Anne's Revenge</i>	"George Brown Wreck"
Exogenous	Federal Legislation	Y	Y	Y	Y	Y	Y
	State Legislation	Y	Y	Y	Y	Y	Y
	Regulations	Y	Y	Y	Y	Y	Y
	Mission Statements	Y	Y	Y	Y	Y	Y
	Organization structure	Y	Y	Y	Y	Y	Y
Endogenous	MOAs	N?	Y?	N?	Y	Y	N
	Management Plans	N	N	N	Y	Y	N
	Agent job descriptions	Y	Y	Y	Y	Y	Y

TABLE 10.18. CAS Element: Rules in exogenous and endogenous environments of six UCH sites. (Table by author).

Federal and State Legislations

As *exogenous environment rules*, this study identified federal and state legislations (as described in Chapter 8). Most important for UCH was the NC 1967 Act, following recovery efforts at *Modern Greece* and *CSS Neuse* sites in the early 1960s. This Act authorized A&H to employ professional staff to undertake, or supervise others to undertake, "...surveillance,

protection, preservation, survey, and systematic archaeological recovery of underwater materials” (NC 1967 Section 3).

Public Agency: A&H: Mission Statement, Organizational Structure and Hierarchies

Under the 1967 Act, A&H was tasked with preserving and protecting North Carolina’s UCH. Since 1973, A&H has been a part of the Department of Cultural Resources (DCR) and since 2015 of the Department of Natural and Cultural Resources (DNCR). As employees of DCR/DNCR, A&H staff as *agents* involved with UCH sites are also required to comply with the overall mission and goals of the larger umbrella organization (NC NCR 2016, 2018).

As a public agency, A&H’s departmental organization, hierarchy, and bureaucracy create *exogenous environment rules* affecting employees’ actions as *agents* in relation to UCH in general and the six UCH sites in particular. A single UCH project at any one time may involve state employees (*agents*), who are variously under The Office of State Archaeology, Historic Sites, or Museums. Each of which are like separate agencies within the organization of NCR, each with its own culture, goals, priorities and perspectives.

Endogenous environment rules are those that determine (or limit) agent actions for a particular UCH project. Such rules might be created by project-specific state legislation for a particular task or activity. For example, legislation in 2007 provided appropriations for CSS *Neuse*’s relocation to a climate-controlled facility and establishment of a Civil War Museum, some 40 years after its recovery from the river in Kinston (as described in Chapters 6 and 9). *Agent* actions may be determined by specifications in a memorandum of agreement (MOA) between various partners involved in the project. For example, for *Queen Anne’s Revenge*, agents actions have been determined by MOAs between: A&H, Intersal Inc, and Maritime Research Institute, between A&H and East Carolina University, and between Office of State

Archaeology and NC Maritime Museum, as well as a 1999 Management Plan (Wilde-Ramsing and Lusardi 1999).

Processes

Under authority of the NC 1967 Act A&H staff over six decades have inventoried and taken actions in relation to almost 1,000 underwater sites in coastal North Carolina (as described in Chapters 6 and 9). Possible archaeological actions (*processes*) in relation to a UCH site are: survey and inventory (Action Level I), investigation (Action Level II), and mitigation (Action Level III). The author identified Level III (mitigation) actions for 14 sites (approximately 2%), including the six sites investigated for this study. *Processes* (actions) for each of which and conservation actions are summarized in Table 10.19.

CAS: ELEMENT:	PROCESSES	UCH SITES					
		<i>Modern Greece</i>	<i>CSS Neuse</i>	<i>Lake Phelps Canoes</i>	<i>USS Huron</i>	<i>Queen Anne's Revenge</i>	"George Brown Wreck"
Arch. Action Level	Survey & Inventory (I)	Y	Y	Y	Y	Y	Y
	Investigation (II)	Y	Y	Y	Y	Y	Y
	Mitigation (III)		Y			Y	Y
Conservation	By Record (C1)		Y	Y	Y	Y	Y
	Passive in Situ (C2)	Y		Y	Y	Y	
	Active in Situ (C3)					Y	
	Reburial (C4)	Y		Y		Y	
	Ex Situ (C5)	Y	Y	Y		Y	

TABLE 10.19. CAS Element: Processes in six UCH Sites as A&H projects. (Table by author).

Outcomes

Four possible *outcomes* for *processes* (actions) undertaken in relation to the six UCH sites were identified as: preservation of vessel remains, preservation of artifacts recovered from the site, public access to the site, and public access to the recovered remains. To determine relative degrees to which these four outcomes were achieved for each site, from qualitative descriptions of the conservation history of each site (Chapter 6) an outcome score (H=3, M=2, L=1) was assigned for each of the possible four outcomes for each site. This score was then calculated as a percentage of the maximum possible score for each outcome. An overall outcome score of 12 (100%) would indicate achievement of total preservation and access for that UCH

site in situ or ex situ. The percentage of maximum outcome scores for each of the six UCH sites is summarized in Table 10.20.

CAS: ELEMENT:	OUTCOMES	UCH SITES					
		<i>Modern Greece</i>	<i>CSS Neuse</i>	Lake Phelps Canoes	<i>USS Huron</i>	<i>Queen Anne's Revenge</i>	"George Brown Wreck"
Preservation	Vessel	1	3	1	1	2	1
	Artifacts	2	3	2	3	2	2
Access	Site	1	1	1	3	1	1
	Artifacts	2	3	2	1	2	1
Total Score		6	10	6	8	7	5
% Max Score (n=12)		50%	83%	50%	67%	58%	42%

TABLE 10.20. CAS Element: Outcomes of six UCH sites as A&H projects. (Table by author).

By this scoring of *outcomes* (Table 10.20) none of the six UCH sites as A&H projects, had achieved 100% preservation of remains or public access to them. The most “complete” was *CSS Neuse*, it having finally been moved into an environmentally controlled museum, and most of its recovered artifacts conserved. Some of the vessel, however, may be still in the river. For *Modern Greece*, the vessel is still in situ and many of the recovered artifacts are still in wet storage. Its conservation history illustrates how active processes may be no longer be undertaken when *agents* (A&H staff) are required to redirect their efforts to other sites or because resources are no longer available, or both.

CAS Behaviors

For a project to be characterized as a CAS, in addition to evidence of the six *elements* as described above, four dynamic *behaviors* need also to be demonstrated: *path dependency*, *bifurcation*, *adaptation*, and *emergence* (Rhodes et al. 2011). Evidence of these behaviors for the six UCH sites are summarized in Table 10.21.

CAS: BEHAVIORS:		UCH SITES					
		<i>Modern Greece</i>	<i>CSS Neuse</i>	Lake Phelps Canoes	<i>USS Huron</i>	<i>Queen Anne's Revenge</i>	"George Brown Wreck"
Path-Dependency		Y	Y	Y	Y	Y	Y
Bifurcation		Y	Y	Y	Y	Y	Y
Adaptation	building capacity	Y	Y	Y	Y	Y	Y
	"boundary spanners"	Y	Y	Y	Y	Y	Y
	power for progress	Y	Y	N	Y	Y	Y
Emergence (vision)	strong	Y	Y	N	N	Y	N
	defensive	Y	Y	Y	N	Y	Y
	single agent	N	N	N	N	N	N

TABLE 10.21. CAS Behaviors for which evidence found for six UCH sites as investigated by author. (Table by author). [Y indicates evidence of behavior and N indicates no evidence found.]

Path Dependency

Path Dependency refers to characteristics of a *system* that were already present as *initial conditions* and which determine agents' actions (Rhodes et al. 2011:14; 152). For the six UCH sites investigated the author found evidence of this behavior. For example, by legislation already enacted since 1903, A&H's responsibilities and tasks in relation to remains of the past were established and thus key *initial conditions* in each case. By the early 1960s, A&H responsibilities to document and preserve the state's history included its historic and archaeological sites, so with technological advances in diving it was only a matter of time before these responsibilities were extended to underwater sites.

At the time *Modern Greece* and *CSS Neuse* were taken on as A&H managed projects, the Civil War Centennial Commission was already established. *Public, political* and *professional interest* was high in relation to all things connected to the 100th Anniversary of the Civil War. By the mid-1980s when the Lake Phelps canoes were discovered, there was already *professional interest* in canoes as a type of UCH site since others had been checked and inventoried by UAB. The creation of USS *Huron* as North Carolina's first shipwreck preserve in 1991 was predicated by initial conditions established by the federal 1987 Abandoned Shipwreck Act. This encouraged states to create underwater parks to encourage and facilitate public access to shipwrecks, as well as to protect and preserve them (Lawrence 2003; 2011). When shipwreck site 31CR314, *Queen Anne's Revenge*, was discovered in 1996, *initial conditions* in place included *public interest* in Blackbeard and his flagship *Queen Anne's Revenge*. This as evidenced by newspaper articles found by keyword search on "Queen Anne's Revenge" at least back to the 1970s (Figure 10.10). In the case of the "George Browne" Wreck *initial conditions* that determined A&H agents' actions (or in view of some public and professionals their inaction) were an already established

A&H policy recording beach wrecks as they were periodically revealed along the coast, but then leaving them to their fate and likely destruction.

Bifurcation

Bifurcation is similar to *punctuated equilibrium* where a state of semi-equilibrium is maintained by variables within the system until something happens that disrupts and disorders this initial equilibrium. Eventually a new state is adopted and a new equilibrium established (Rhodes et al. 2011:15). The sudden increase in *public interest* as indicated by jump in biennial year-to-year percentage change in numbers of newspaper articles when a UCH site is discovered but which then settles down (as in Figure 10.10) are an example of this.

Adaptation

Adaptation refers to changes agents make in response to actions of other participants, environmental conditions, or emergent systems (Rhodes et al. 2011:14). Adaptation processes may include building capacity for effective stakeholder involvement, key individuals functioning as “boundary spanners” influencing and advancing projects across institutional boundaries, and establishment and recognition of the balance of power and power relationships needed to progress a project (Rhodes et al. 2011:14;155-158).

As described in Chapter 6, in each of the six UCH projects investigated, the author found evidence for all of these adaptive behaviors to greater or lesser extents. Building stakeholder involvement is also an expectation for A&H staff as *agents* involved in these projects under DCR/NCR’s mission statements. For example, *Modern Greece* stakeholder involvement over the years has included US Navy, NC CCC, UNC system universities (UNCW, ECU), different sections within A&H, and many hundreds of public volunteers and students (Bright 1977; Grieve 2011). For CSS *Neuse* critical stakeholder involvement was created by members of the local

community including the press in Kinston, as well as professional colleagues at ECU. Of the six UCH sites, *Queen Anne's Revenge* has the largest and widest ranging stakeholder involvement, with *public*, *political*, and *professional* interest in it as evidenced by this study. By following the histories of each of the six UCH sites from discovery to present, it is evident that key individuals (*public*, *political*, and *professionals*) were “boundary spanners” variously influencing, instigating, encouraging, facilitating, and undertaking actions to progress them as A&H projects.

Emergence

Emergence refers to new but unpredicted properties of a *system* created as a result of actions taken over time, for example, as evidenced by a new stated *vision* as “a driver for change”. Rhodes et al. 2011:14; 159-160) identified four different types of such vision. A *strong vision* was consistent over time and agreed by all participants. A *defensive vision* protects professional or territory boundaries. A vision may be that of a *single agent*. An *adaptive vision* may evolve by negotiation if all participants agree how to move forward. Types of these “vision statements” identified by the author for the six UCH sites are summarized Table 10.22.

The strong fundamental *vision* determining A&H actions for UCH was the 1967 Act that recognized the significance and value of thousands of historical and archaeological underwater sites off North Carolina's coast. It stated that these were “valuable resources” ... “vital to the interpretation of North Carolina history, government, and culture to the citizens of the State... but were in danger of destruction and loss through natural elements and human actions” (NC 1967).

Official Visions for Change	Strong	Defensive	Single Agent(s)	Adaptive
NC Constitution Article XIV, Section 5	Y			
NC Historical Commission (1907:3)	Y			
A&H Biennial Report (1907:15-16)	Y			
1935 Public Records Act		Y		
1935 Historic Highway Markers	Y			
1945 NC Archives and History Act	Y	Y		
1953 Submerged Lands Act		Y		
1955 NC Archives and History Act (Historic Sites)	Y	Y		
1959 NC Confederate Centennial Commission est.	Y			
1963 Act to establish Preservation Lab at Fort Fisher	Y			
1966 National Historic Preservation Act		Y		
1967 Act to Establish Ownership...Underwater Sites		Y		Y
1971 Executive Organization Act	Y	Y		
1973 NC Archive and History Act (DCR est)	Y	Y		Y
1987 Abandoned Shipwreck Act		Y		
1991 USS Huron Shipwreck Preserve	Y			
1997 Designation of Shipwreck site 31CR314 Protected Area		Y		
1999 QAR Management Plan	Y		Y	
2004 NRHP listing of QAR	Y			
2007 Act to Appropriate Funds (\$3.5m) to CSS Neuse				Y
2015 NC Archive and History Act (DNCR est)		Y		Y
2016 DNCR Mission Statement	Y			Y

TABLE 10.22. Summary of official “Vision” statements as drivers for change in relation to or arising from six UCH sites as A&H projects (from Chapters 7 and 9). (Table by Author).

Discussion

Interest indicator data for the six UCH sites were qualitatively and quantitatively analyzed against six *elements* (*system, environment factors, environment rules, agents, processes* and *outcomes*) and four *behaviors* (*path-dependency, bifurcation, adaptation and emergence*) proposed by Rhodes et al. (2011) by which a public project may be characterized as a CAS. From this “6 + 4” CAS framework as applied to the six UCH sites all exhibited evidence for all six elements (nature of system) and four behaviors, and can therefore all can be characterized as *complex adaptive systems*.

Summary

This chapter presented results of the author’s analyses of *interest indicator* and *conservation actions* data from the perspective of three public management systems models. This was to characterize the nature and behavior of the A&H management system within which policy

for UCH is implemented in North Carolina as *traditional* or *complex* (RQ4). Data was analyzed from perspectives of the *Cyclical Public Policy Process Model* (Kraft and Furlong 2007:71-72), a *Dynamic Systems Model* (Dooley and Van de Ven 1999; Haynes 2008), and a *complex adaptive system* (CAS) model (Rhodes et al. (2011)). By these analyses the A&H management system was characterized as *traditional* by the *Cyclical Public Policy Process Model*, as both *traditional* and *complex* by the Dynamic Systems Model analyses, and projects as *complex adaptive systems* by Rhodes et al. (2011) analytical framework for identifying a CAS. The implications of and recommendations from these findings for future conservation management of UCH by a public agency (A&H) in North Carolina are discussed further in the next chapter.

CHAPTER 11

CONCLUSION

Conservation: "...the process of managing change to a significant place in its setting in ways that will best sustain its heritage values, while recognizing opportunities to reveal or reinforce those values for present and future generations."
(English Heritage: 2008:7)

Introduction

Since the 1960s, North Carolina's public agency for Archives and History (A&H) has had legislated responsibility to implement public policy for the state's thousands of abandoned shipwrecks and other underwater archaeological sites in state waters. In 1967, state legislation was enacted that recognized these remains as "*valuable resources*" ... "*vital to the interpretation of North Carolina history, government, and culture to the citizens of the State*" but in danger of destruction and loss through natural and human causes (NC 1967). For this study UCH was defined as the underwater physical remains of past human existence in North Carolina that have societal value and significance in the present.

From a professional conservation perspective, it may be obvious what technical and scientific actions are needed to maximize usability and longevity, and to enhance value of remains of the past such as UCH for those with an interest in them (Appelbaum 2007: xxvii). The public management challenge is deciding which type and level of action to implement for which site and when, and with resources available how to most effectively implement public law and policy (Wilde-Ramsing and Alford 1990; Wilde-Ramsing in Hotz 2011). By *organization theory* essential for effective management of work to implement public policy is understanding the organization, including its history, culture, context, and environment (Handy 1985; Rainey 2009). With such understanding a conceptual framework to guide managers would ideally: "Help one to *explain* the Past which in turn Helps one to *understand* the Present and thus to *predict* the

Future which leads to More *influence* over future events and Less *disturbance* from the Unexpected.” (Handy 1985:16). The purpose of this study was to understand A&H as a public organization and its work to conserve UCH in North Carolina. The goal of the study was to propose a conceptual framework to help managers, archaeologists, and conservators to understand A&H as a public organization, its context, tasks, and UCH sites, in relation conservation management of remains of the past in state waters.

Towards this goal, the author investigated and characterized from a system’s perspective the context for conservation management of UCH in North Carolina since the 1960s. This included determining whether by nature and behavior A&H management systems in general, and for six UCH case study sites in particular, could be characterized as *traditional* or *complex systems*. Depending on which, for effective management in each system different management approaches are recommended by researchers (Haynes 2003, 2008; Geyer and Rihani 2010; Byrne and Callaghan 2014).

This study’s overall research question (RQ1) asked: How can conservation of UCH be managed by public agencies? Towards answering this the author investigated (RQ2): How has conservation of UCH been managed by public agencies in North Carolina and what factors influenced actions taken? The third research question (RQ3) asked: How do people’s - *public*, *political* and *professional* - *interests* influence and correlate with *conservation actions* taken, and how have these changed over *time*? The fourth research question (RQ4) asked: What is the nature and behavior of the context (as a public policy system) for conservation management of UCH in North Carolina? From understanding of the A&H management system for UCH in North Carolina as gained through this study, a conceptual framework for informing future conservation management of the state’s UCH (RQ5) is proposed.

This chapter first summarizes findings from investigations as were described fully in previous chapters, and from which the conceptual framework proposed in this chapter was crafted. The significance of this study for various people as players with an interest in UCH in North Carolina are discussed. Recommendations are made as to how conservation of UCH could be managed by A&H in future and the conceptual framework further tested.

Summary of Study and Findings

This study's investigations and findings were described in the previous 10 chapters of this dissertation. In *Chapter 1 – Introduction*, the context, problem statement, purpose and goal of the study, its significance, research approach, research questions, and organization of the dissertation were briefly described.

Chapter 2 - Methods and Models, described the research approach, data sources and collection methods, and analyses methods and models. The study used a mixed methods case study approach. Factors investigated as variables were levels of *public*, *political*, and *professional* interests, *conservation actions* and *time*. The study examined and analyzed data collected in relation to these variables to understand conservation management of UCH by A&H in general, and for six UCH case study sites in particular. The case study sites were: *Modern Greece*, *CSS Neuse*, *Lake Phelps Canoes*, *USS Huron*, *Queen Anne's Revenge*, and the "George Browne" Wreck" (Table 2.1; Figure 6.2). Data were collected through: literature review (published and unpublished sources), searches of A&H archives, unpublished reports and databases, and data mining of publicly available online databases. Through qualitative analyses, context descriptions and storylines were constructed for A&H's implementation of public policy for UCH generally, and for the six sites in particular. Through quantitative and qualitative analyses of data, correlations between levels of *players' interests* and *conservation actions*, and

the nature and behavior of the A&H management and UCH projects as systems were investigated and characterized.

Chapter 3- *Public Management*, from literature review defined and described, public management, public policy, public agencies, and changing approaches to public management including from *traditional* and *complex* management systems perspectives. A *traditional* approach to management assumes that as a system the organization and projects can be understood as the sum of their component parts, and be defined by their relations and interactions within known conditions and context. All of which remain stable, regular, ordered, predictable and unchanging over time. There is a predictable logical linear progression between cause and effect from inputs to outcomes when implementing public policy (Geyer and Rihani 2010; Stacey 2010). In such a context effective management can be achieved through activities such as planning, budgeting, performance appraisal, and quality control. A goal can be identified, timescales forecast, outputs and outcomes predicted, monitored, and evaluated in relation to achievement of the goal (Stacey 2010:38-39).

In a *complex system*, however, the whole is more than the sum of its parts and its behavior cannot be predicted from analysis of parts and their interactions separately. *Complex systems* are unstable, irregular, not logically ordered, unpredictable, and change over time. They have structural properties (openness, heterogeneity, diversity, and memory) and dynamical ones (self-organization, uncertainty, adaptation, and emergence). The system is *open* with energy and information exchanges between component parts within the system (*endogenous* environment), and between them and external components (*exogenous* environment). With direct and indirect interactions, and negative and positive feedback loops, the behavior of the system is unpredictable; small actions may have large effects and vice-versa (Cilliers 2000; Cairney

2012:347-348; Parrott and Lange 2013:17). Public policy develops in response to a variety of local and context specific forces. What works in one situation does not necessarily transfer to a different one. A *complex system* has self-organizing capacity and reactions or outcomes in response to forces may not be predictable or controllable. In an unstable and changing situation people (as agents) in the system will change and adapt policy to fit circumstances, and may also take actions to influence the system (Cairney 2012:348-349).

Chapter 4 - Coastal North Carolina: Place and People, described these parts of the exogenous environment as context within which A&H manages conservation of UCH. The *nature* of the *place* is determined by its geography and *natural coastal system*. On the Atlantic seaboard state waters include extensive estuaries, rivers, lakes, swamps, and wetlands, as well as hundreds of miles of coastline and offshore waters. The area is prone to major storm and hurricane events, due to two opposing ocean currents meeting just off the coast at Cape Hatteras (the warm Gulf Stream and the cold-water Labrador Current). By these natural events this *place* is both built and destroyed (Riggs et al. 2011:24-31; Savidge et al. 2013).

People have come to coastal North Carolina for thousands of years for its living and non-living coastal resources. By 2010, the state's total *resident population* was approximately 9.5 million, of whom approximately 1% were Native American, 8% Hispanic, 68 % white, and 20% black (US Census 2012). From US Censuses since 1790, data was collated by the author to investigate the changing demography of North Carolina including of its coastal region. In some counties population is increasing (for example New Hanover County) but in others is decreasing (for example Tyrrell County). Through the 20th century population shifted from rural to urban areas and by 2010 about 66 percent were urban. The most densely populated and expanding Coastal Plain urban areas are Wilmington (New Hanover County) and Elizabeth City

(Pasquotank County). In a high energy, storm dependent environment, as in Coastal North Carolina, physical aspects of people's maritime present can quickly become their maritime past.

Chapter 5 – Conserving Underwater Cultural Heritage, described from literature reviewed how physical remains of people's activities in the past may be preserved or destroyed underwater depending on the nature of the material remains and of the deposition environment. Degree of preservation may depend on how quickly remains are covered by sediments, depth of cover, and how long they remain covered (Ward et al. 1999a, 1999b; MacLeod 2002, 2012; Wheeler 2002; Arnott et al. 2005; Palma 2005; McNinch et al. 2006; Björdal and Nilsson 2008). For this study, from a technical and scientific perspective five possible conservation actions for UCH were identified as: *conservation ex situ* (C5), *reburial* (C4), *active conservation in situ* (C3), *passive conservation in situ* (C2), and *conservation by record* (C1). Traditionally material heritage conservation aimed to prevent its change (Berducou 1990). That change is inevitable, however, is increasingly acknowledged as part of the heritage conservation management process (English Heritage 2008:7). Since the 1980s under the influence of post modernism (Poulios 2010) in addition to managing change, conservation managers need also to take account of the intangible aspects of material remains as well as the tangible (Kapelouzou 2012). Maximizing usability, achieving longevity, enhancing value, and managing change are now all identified as goals for conserving physical remains of the past (Appelbaum 2007: xxvii; English Heritage 2008).

Chapter 6 – Implementing Public Policy for North Carolina's Underwater Cultural Heritage, described archaeological and conservation actions taken by A&H for North Carolina UCH in general and for six case study sites in particular since the 1960s. This was to understand how conservation of UCH has been managed— what actions have been taken, and what factors

influenced actions (RQ2). To characterize actions taken for UCH the author undertook a critical discourse analysis of references in the *North Carolina Bibliography of Underwater Archaeology* (NC A&H/OSA/UAB 2016) in combination with information on sites listed in the *Underwater Sites Database* (NC A&H/OSA/UAB 2011). For 808 UCH sites in OBX counties the maximum level of archaeological action for 53% was Level I – Survey; for 8% it was Level II – Investigation; for 2% it was Level III – Mitigation. For 37% of these sites it was not possible to determine levels of action by this methodology.

Six UCH case study sites were selected by criteria described in Chapter 2. Conservation histories, including conservation actions (C1-C5) taken, were constructed for each site from literature, archive and database searches. Sites were rank ordered by an overall conservation rank number for each site. This was calculated as the sum of conservation actions taken (Table 6.6). By this method most conservation actions were taken for *Queen Anne's Revenge* and least for the “George Browne” wreck. Six possible factors were identified as influencing conservation actions in each case: *weather, technological developments, government framework, resources available, time, and people's interest*. These factors in relation to a particular site were not necessarily sequential, nor exclusive at any one time. Management decisions for conservation actions depended on a confluence of factors at a particular moment as well as over the long term. Conservation decisions for a particular UCH site may depend not only on condition and threats to the site, but also on different *players' interests (public, political, and professional)* in it.

Chapter 7 – Public Interest in North Carolina's History, Remains of the Past and UCH, described results of the author's investigation of levels and types of *public interest* in North Carolina for its history, remains of the past, and UCH generally since the early 1960s, and in relation to the six UCH case study sites in particular. Two indicators of levels of *public interest*

were *reading public interest*, and *visiting public interest*. Indicator data collected was analyzed by period totals.

Indicator data for *reading public interest* were numbers of relevant articles found for various keyword searches of *America's News Historical and Current* (ANHC) online database. Keyword *history* was found in approximately 8% of all NC articles (n= 6.35 million). Of history sub-set keywords most articles were found for *history* with: *public*, *Civil War*, *cost*, *education*, and *site*. By OBX counties, keyword searches for *archaeology* and *underwater* found just 475 articles. Zero articles were found for “*underwater cultural heritage*”. Of articles found for *scuba* (0.06%) from sub-set keyword searches with *scuba* there was more interest in *fishing* (18%) than in *shipwrecks* or *archaeology* (3%), or in *cultural heritage* (0%). (Table 7.1, 7.2, 7.3, Figure 7.1, 7.2, 7.15 to 7.18). For the six UCH sites, there was most *reading public interest* in *Queen Anne's Revenge* and least interest in USS *Huron* (Figure 7.29). Of the ASAs there was most *reading public interest* in Fort Fisher Historic Site and least in the CSS *Neuse* Historic Site (Figure 7.29).

Indicator for *visiting public interest* were numbers of visits to UCH sites and ASAs (NC PED 2012; NC VP 2015; NC A&H 1960-2016). In 2010, approximately 37 million visits were made statewide, of which 43% were North Carolina residents, and over 80% were white. Most visits were for leisure. Between 5% and 10% were to places connected with history and the past (NC DTFSD 2011-2014; NC VP 2015). In 2010-2011 of approximately 20.5 million visits made to state attractions across North Carolina, most (over 1.6 million) were to Jockeys Ridge State Park in Dare County and fewest (approximately 10,000) were to CSS *Neuse* Historic Site in Lenoir County (Figure 7.23). New Hanover County received approximately 35% of all visits to all state attractions in OBX counties (NC PED 2012). USS *Huron*, was the only UCH site, as a

Shipwreck Preserve accessible to the visiting public, receiving approximately 300 underwater visitors per year (Lawrence 2003).

Chapter 8 – Political Interest in History and UCH in North Carolina, first reviewed the state government framework in North Carolina, including federal and state legislation relating to history, remains of the past, UCH, and A&H. Indicator data for levels of *political interest* were numbers of state *legislative* Acts and amounts of *appropriations* - recurring (R\$) and non-recurring (NR \$). Data sources included: *North Carolina Office of Archives and History Biennial Reports* (A&H 1960-2014), *NC Program Evaluation Division Report 2010-2011* (NC PED 2012); *North Carolina State Budgets*, and *North Carolina's Governors Budgets*.

Most *legislation* (federal and state) affecting UCH was enacted during the 1970s (Figure 8.2). By average number per year of state legislations since a site came under A&H management there was most interest in *Queen Anne's Revenge* (0.7 laws per year), and least in Lake Phelps Canoes, USS *Huron*, and Corolla Shipwrecks for which no session laws were found. For ASAs, was most political interest in NC Maritime Museum (0.42 per year) and least in Jockeys Ridge State Park (0.09 per year). State legislation also included for recurring (R\$) and non-recurring (NR\$) appropriations from the General Fund (GF). Over the period of this study, A&H received some approximately 0.16% of the GF total budget. Since 1959-1960, A&H historic sites section total average R\$ appropriation per year as a percentage of the average total A&H R\$ appropriation was approximately 33%, for NC Maritime Museum, Beaufort approximately 10%, and for Archaeology 5%. For the six UCH sites since the 1960s by period totals and by average *R\$ appropriations* per year there was most *political interest* in CSS *Neuse* (\$297,000 per year) and least in Lake Phelps Canoes, USS *Huron*, and Corolla Shipwrecks (all with none).

In 2010/2011 approximately 68% of DCR's total (R\$) (\$28.8m) was allocated to A&H. Of which approximately 29% was allocated to seven museums and 18% to 22 historic sites (NC PED 2012). Sixteen A&H attractions in the Coastal Plain region received approximately 40% of DCR's annual appropriation, 90% of which went to 12 sites in nine OBX counties. Coastal Plain IBX sites received on average \$0.25 million per site and those in the OBX on average \$0.79 million per state attraction.

By average NR\$ *appropriations* per year there was most *political interest* in *Queen Anne's Revenge* (\$161,000 per year), however, there were years in which no NR\$ for operational costs were appropriated. Lake Phelps Canoes, USS *Huron*, and Corolla Shipwrecks all had no NR\$. For ASAs, there was most *political interest* by R\$ in NC Maritime Museum (\$1.35 million per year) and least in Graveyard of the Atlantic Museum (\$233,333 per year). By NR\$ there was most interest in Fort Fisher Historic Site (\$255,877 per year) and least in Jockeys Ridge State Park (\$17,857).

Chapter 9 – Professional Interest in Preserving History and Physical Remains of the Past in North Carolina, first defined *professionals* and reviewed A&H as a public organization in which many of its staff are professional historians, archaeologists, conservators, and curators. For understanding of A&H's *professional interest* generally in remains of the past the author focused on three A&H managed programs by undertaking a critical discourse analysis of program databases for the *North Carolina Highway Historical Marker Program* (NC HHM 2011, 2017), North Carolina listings on the *National Register of Historic Places* (NC NRHP 2016), and *underwater sites* inventoried in the *Sites Database* (NC A&H/OSA/UAB 2011).

In April 2017, there were 1,580 historical markers statewide, approximately 43% of which were in Coastal Plain counties (Figures 9.4-9.7). As categorized in the NC HHM database

(2011) 114 markers had a maritime theme, of which with 83 (73%) were in 16 of 20 the OBX counties. Fifty percent of maritime related markers had a military theme, of which 93% were in Coastal Plain counties and 65% related to the Civil War. Counties with the most military themed maritime markers were New Hanover (11) and Dare (9).

In October 2016, there were 2,975 North Carolina sites (3% of the national total) listed on the *National Register of Historic Places* (NC NRHP 2016). Of which 30% were in Coastal Plain counties, and 60% of these were in IBX counties. IBX county with most sites listed was Cumberland (37) and with least was Hoke (5). OBX county with most listed sites was Craven (57) and with least was Pamlico (one). By theme as categorized by the author, statewide most listed sites had a *people/place* theme (39%), and fewest an *archaeology UCH* theme (0.5%) (Figures 9.17-9.20). In IBX counties there was one UCH site listed (CSS *Neuse*) and in OBX counties 15. Most of these were in Dare County (10) and fewest in Carteret County (3). New Hanover County had two NRHP district listings - the Cape Fear Civil War Period Shipwreck District (21 UCH sites), and the Wilmington Historic Shipwreck District (37 UCH sites). In 2011-2015, 10 sites with an *archaeology UCH* theme were listed, most being shipwrecks in connection with Battle of the Atlantic sites.

By 2011, A&H staff had inventoried approximately 950 UCH sites (NC A&H OSA/UAB 2011). Of which 98% were in Coastal Plain counties, with 837 (88%) variously in all 20 OBX counties (Figure 9.21-9.23). Counties with the most UCH sites were New Hanover (163), Beaufort (150), and Dare (105). Six IBX counties had no UCH sites listed. By body of water zoning codes, 62% of all sites were in rivers and creeks (Figure 9.24-9.27). In IBX counties approximately 83% of sites were in rivers and in OBX counties 55%. Approximately a third of all UCH sites were located in ocean side environments of which about half were beach wrecks,

and a quarter were inlet locations. By site theme as coded by the author most with an *economy* theme were in Beaufort, New Hanover and Dare Counties, fewest were in Washington County. Most sites with a *place* theme were in Dare County, and fewest in Washington/Tyrrell. Most sites with a *military* theme were in New Hanover County. Most *canoes* were found in Washington County (Table 9.2; Figure 9.28).

To investigate *professional interest* particularly in the six UCH case study sites and six ASAs two sets of interest indicator data were collected - numbers of publications found by keyword searches of *Google Scholar* and numbers of references listed in the 2016 *Bibliography* (NC A&H/OSA/UAB 2016). By numbers of publications in *Google Scholar* for the six UCH sites there was most interest in *Queen Anne's Revenge* and least in Lake Phelps canoes. For ASAs there was most *professional interest* in the NC Maritime Museum and least in CSS Neuse Historic Site. By numbers of references found in the 2016 *Bibliography* there was most *professional interest* in *Queen Anne's Revenge* and least interest in CSS Neuse.

Chapter 10 – *Analyses and Models*, described results of the author's analyses of data for levels of *players' interest* and *conservation actions over time*, and from the perspective of three public management systems models. This was to answer the fourth research question (RQ4) of this study: what is the nature and behavior of A&H as an organization in general and of the six UCH projects in particular; can they be characterized as *traditional* or *complex systems*?

Analyses from the perspective of the *Cyclical Public Policy Process* (CPPP) model (Kraft and Furlong (2007:71-72) included calculating Spearman rank correlation coefficients for rank ordered sets of *players' interests* and *conservation actions* for the six UCH sites and ASAs. By which *medium to very strong* levels of correlation were found. For UCH sites, *very strong* correlations were found between *public interest (reading)* and *political interest (legislation and*

NR\$ appropriations). A *strong* correlation between *player's interest* and *conservation actions* was only found for *public interest (reading)* (Table 10.7). The varying degrees of correlation found between *players' interests* and *conservation actions*, suggest some logical progression from cause to effect, from one level of players' interest to the next and to conservation actions, as predicted by the CPPP model. The CPPP model assumes a *traditional management system*. By analysis of total data for UCH sites and ASAs from the perspective of this model, therefore the A&H system was characterized as *traditional* (FIGURE 10.1; Table 11.1).

By time series analyses of data from the perspective of a *Dynamic Systems* model (Dooley and Van de Ven 1999; Haynes 2008) the author characterized dynamic change patterns for biennial year-to-year percentage change for *player's interest data* for A&H totals, six UCH sites, and ASAs. Change patterns of time series and return plots were visually identified by comparison with controls (Figures 10.5-10.8). Of change patterns thus visually identified, 2% were *periodic*, 68% *random*, 2% *chaotic*, and 28% *complex*. From Dooley and Van de Ven's (1999) matrix model (Table 10.12) for each dynamic change pattern two characteristics of the causal system could be inferred, dimensionality (number of variables) and nature of interactions between them. *Periodic* and *random* change patterns were interpreted by the author as likely indicative of a *traditional (management) system*, and *chaotic* and *complex patterns* as indicative of *complex (management) systems* (Table 10.14a, Table 11.1).

By Rhodes et al. (2011) analytical framework for identifying a *Complex Adaptive System* (CAS) interest indicator data for the six UCH sites were qualitatively and quantitatively analyzed against six *elements (system, environment factors, environment rules, agents, processes and outcomes)* and four *behaviors (path-dependency, bifurcation, adaptation and emergence)*. From the perspective of this model, all six sites exhibited evidence for all six elements (nature of

system) and four behaviors, and all were therefore characterized as *complex adaptive systems* (Tables 10.15-10.22).

From analyses of data from the perspectives of the three management systems models as summarized above the nature and behavior of the A&H management system for UCH in North Carolina were identified as summarized in Table 11.1. From data for each UCH site when analyzed separately the nature and behavior of the systems was identified as *complex*. When combined data was analyzed (as against the CPPP model) the overall system exhibited the nature and behavior of a *traditional system*.

Systems Model			Management System Type/Approach	Reference
Cyclical Public Policy Process	Players Interests & Conservation Actions	Correlation (rs)	Traditional	Table 10.8
	Public Reading to Public Visiting	VS		
	Public Reading to Political NR\$	S		
	Political Legislation to Professional Publication	VS		
	Political Legislation to Conservation Actions	M		
	Political NR\$ to Conservation Actions	VW		
Dynamic Systems	All Players' Interests Change Patterns	% Change Patterns		Reference
	Periodic	2%	Traditional	Table 10.14
	Random	68%		
	Chaotic	2%	Complex	
	Complex	28%		
Complex Adaptive System	Six UCH Sites	Evidence of in		
	6 Elements	100% (of sites)	Complex	Table 10.15 to Table 10.20
	4 Behaviors	77% (by indicators)		Table 10.21

Table 11.1 Summary of Type/Approach of Management Systems (traditional or complex) as identified by author from analyses of players' interest data from perspectives of three public policy models (Kraft and Furlong 2007; Dooley and Van de Ven 1999, Haynes 2008; Rhodes et al. 2011). Key: VS=very strong, S=strong, M=medium; VW= very weak. (Table be author).

A Conceptual Framework for Conservation Management of UCH in North Carolina

The aim of this study was to investigate and understand from a systems perspective A&H's management of conservation of UCH in general, and for six UCH sites in particular. A&H is the public agency organization responsible for implementing public policy for UCH in North Carolina since the 1960s (NC 1963; NC 1967). UCH for this study was defined as physical remains of peoples' activities in the past that are now underwater but that have value and significance for people in the present such that they want remains to be protected and preserved for the future.

Effective management requires understanding the interplay of variables in a system and how they affect each other. *Organization theory* aims to help explain the difference between an organization's failures and successes. By conceptualizing and understanding what actions work or worked well they may be repeated, and managers may then know what can be altered and how alteration might affect the situation overall (Handy 1985:18-19). Variables focused on for this study were *players' (public, political, and professional) interests, conservation actions, and time*. From understanding gained through this study of the interplay of these variables - *players interests* and *time* in relation to *conservation actions* of A&H for UCH in North Carolina, the author proposes a conceptual framework as illustrated in Figure 11.1.

In the *Cyclical Public Policy Process* (CPPP) model (Kraft and Furlong 2007) (Figure 10.1) *public, political, and professional players' interests* appear to operate sequentially but separately, and the role of time (in the long-term) as a variable is not clear. From the conservation case histories and analyses of interactions between *players' interests* over *time* for the six UCH sites investigated by this study it is evident that for *conservation actions* to be effectively implemented and sustained each group of *players' – public, political, and*

professional - all have to be interested at the same time and remain interested over time, as represented by the anchor in Figure 11.1.

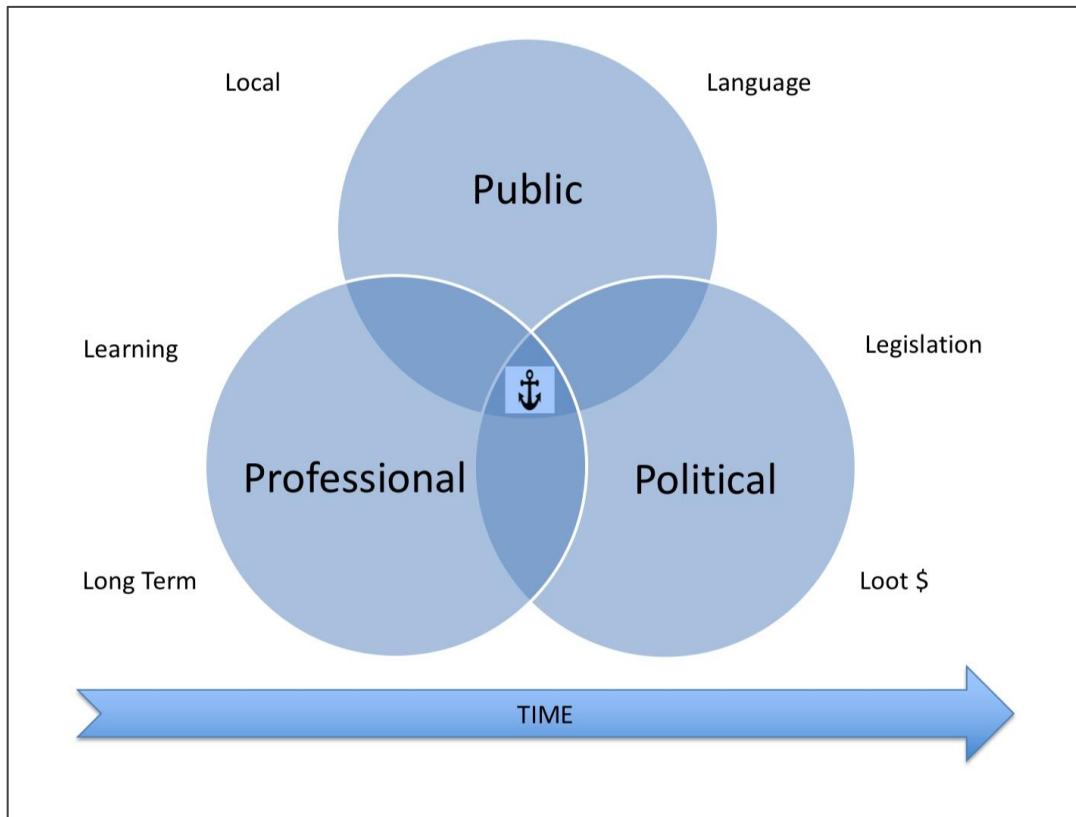


FIGURE 11.1. A conceptual framework for conservation management of UCH in North Carolina. (Figure by author).

What each group of players contributes to the conservation management process are also shown in Figure 11.1. All factors need to be in play in the same place at the same time, and to continue to be so over time, in order for sustained effective conservation management of UCH. From the conservation histories of the six UCH sites investigated for this study it was evident this rarely happens. By this proposed conceptual framework for conservation management of UCH (Figure 11.1) the situation for a particular site at a particular time can be demonstrated.

In Figure 11.2, the situation for each of the six UCH sites as it seemed to be around 2014 is illustrated. At this time for only one of the case studies - CSS *Neuse* – were all *players'* interests coincident. For QAR at this time there was *professional* and *public interest* but no

political interest as indicated by lack of operational funding (appropriation NR\$). For Lake Phelps canoes there was only *professional interest* in them.

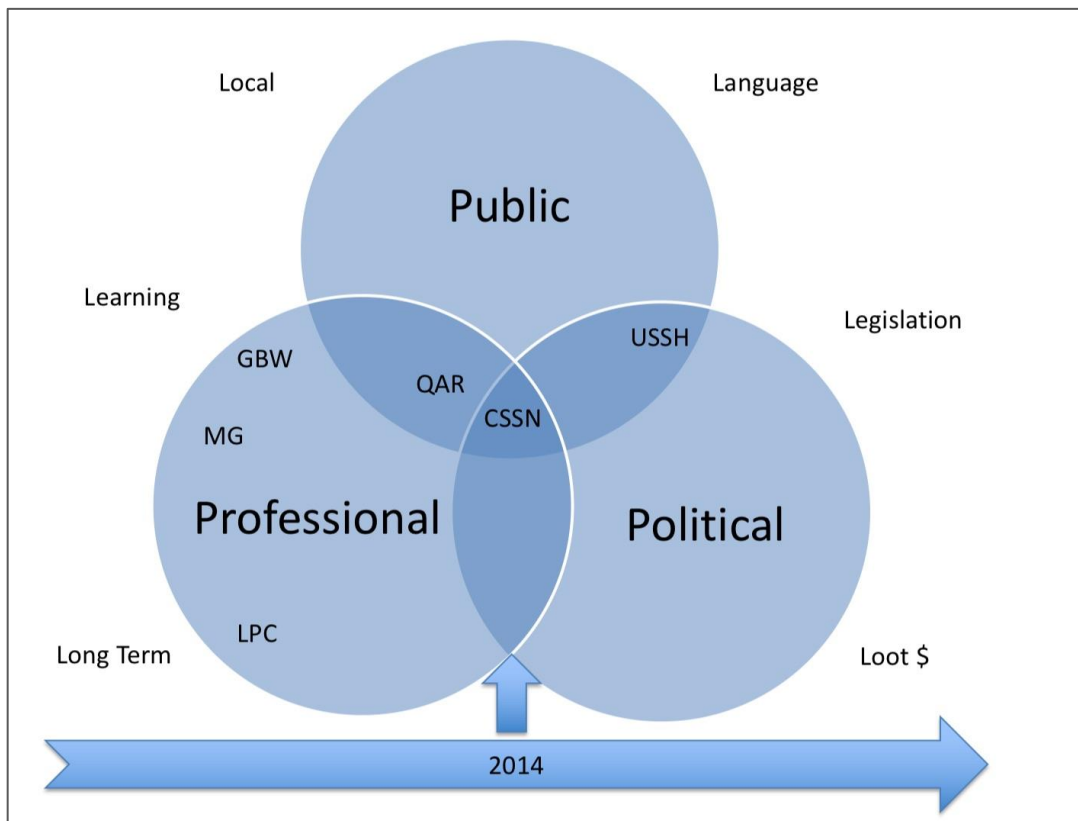


Figure 11.2 Conservation management status for six UCH sites in North Carolina in 2014. Key: MG = *Modern Greece*, CSSN = *CSS Neuse*, LPC = *Lake Phelps Canoes*, USSH = *USS Huron*, QAR = *Queen Anne's Revenge*, GBW = "George Browne" wreck. (Figure by author).

This conceptual framework (Figure 11.1) could help managers understand the conservation management challenges of a particular site by illustrating its management history over time. The same UCH site as a project could be in a different place on the diagram at different times. For example, on April 6, 2010, when the "George Browne" (GBW) Wreck was removed from Corolla Beach, *public*, *political*, and *professional interests* in it coincided. Thus, in the model it would be in the place of the anchor. In 2014, however, with only *professional interest* in it, its position is as shown in Figure 11.2. By this model to progress its conservation would require not only re-activating *public*, *political*, and *professional players' interests* in it, but also for these interests to be coincident at the same time, as well as over time.

Future Conservation Management of UCH in North Carolina

The overall research question (RQ1) of this study asked “How can conservation of UCH be managed by public agencies? From this investigation and understanding gained of A&H’s management of UCH in North Carolina since the 1960s, the author recommends its future management be based on: understanding the nature of UCH as a resource in North Carolina; understanding the significance and value of UCH to different groups of people (public, political, and professional) with an interest in it; and understanding the nature and behavior of the management context(s) as traditional or complex management systems, and implementing different management approaches as appropriate to each.

Understanding the UCH resource in North Carolina requires knowledge of what and where it is, and factors as variables (including weather, resources, people, technological developments, and climate change) and interactions between them that may or may not threaten its longevity and usability. The UCH resource in North Carolina and its conservation status, as known at the end of 2018 is summarized in Figure 11.3. The locations of A&H managed state attractions related to UCH, and of UCH sites as inventoried and listed in the 2011 *Sites Database* (NC A&H/OSA/UAB 2011) by coastal region county are shown in Figure 11.4.

For future management of the resource a starting point would be A&H’s inventory of UCH sites, and knowledge of the resource that has accumulated over six decades. A conservation management plan would include methods for identifying UCH sites’ significance based on its potential for preserving, protecting, and presenting histories of all of North Carolina’s people. Methodologies used in this study could be used by conservation managers to determine extent of people’s interests in UCH, how these may change over time, and how influence conservation actions taken or planned.

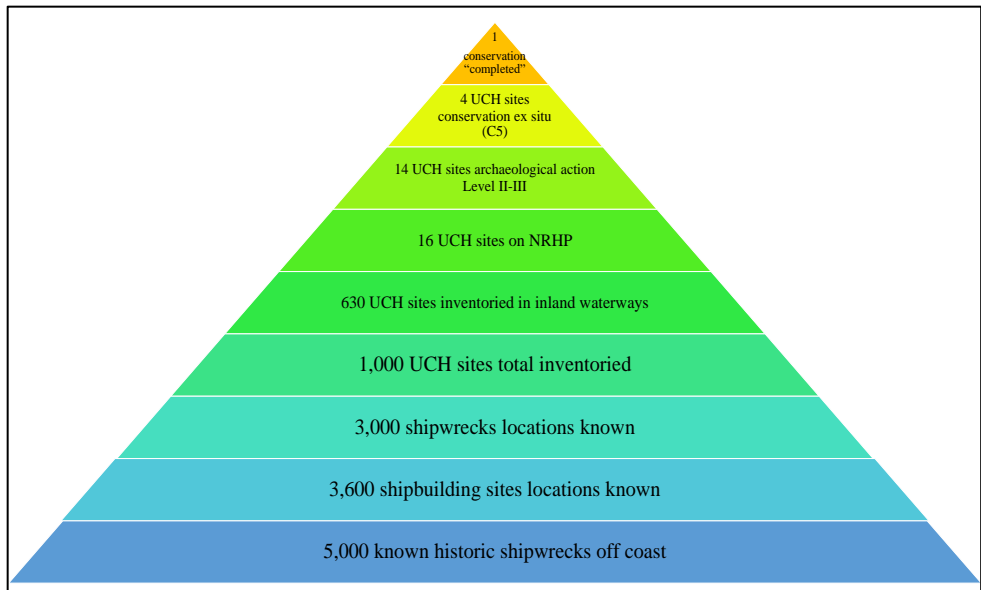


FIGURE 11.3. Summary of North Carolina’s UCH as at end of 2018. (Figure by author, data sources: as in Chapters 5-9, including Babits (2002); Lawrence (2011); NC A&H/OSA/UAB (2011; 2016); Stills and Stephenson (2019)).

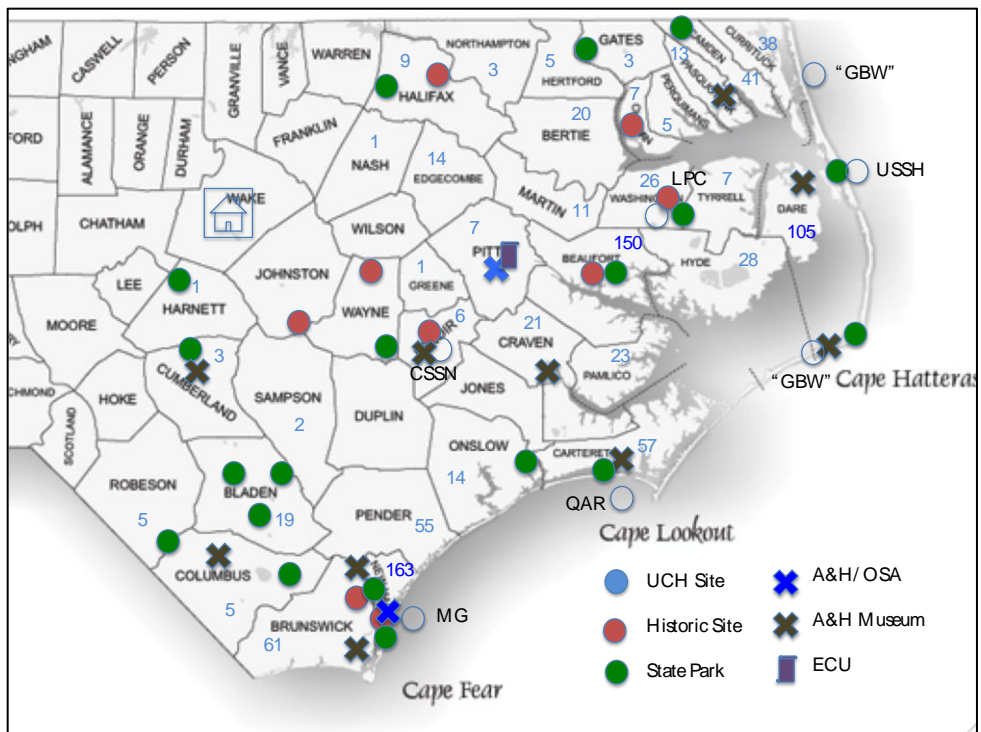


FIGURE 11.4. Locations of Coastal Plain A&H managed sites and state attractions since 2015 including: historic sites, museums, state parks, A&H, OSA, and QAR Lab at ECU. (Figure by author, data sources: NC PED (2012); *Sites Database* (NC A&H/OSA/UAB 2011); base map https://www.ncpedia.org/sites/default/files/images/enc/map09_lg.png).
 Key: MG = *Modern Greece*; QAR = *Queen Anne's Revenge*; GBW = *George Browne Wreck*; USSH = *USS Huron*; LPC= *Lake Phelps Canoes*; CSSN = *CSS Neuse*

The conceptual framework proposed from this study (as in Figure 11.1) could be applied by public agency conservation managers in future to understand the conservation management challenges of a particular site by illustrating its management history over time. By conceptualizing and understanding what and how actions work or worked well in the past may help inform future management approaches. By this model to progress conservation of UCH would require not only activating *public, political, and professional players' interests* in it, but also for these interests to be coincident at the same time, as well as sustained over time.

The management approach selected to implement public policy for UCH effectively should depend on whether the system is characterized as *traditional* or *complex* (Byrne and Callaghan 2014; Cairney 2012; Geyer and Rihani 2010). Results of this study's investigations indicate that the nature and behavior of systems within which public policy for UCH in North Carolina is implemented have characteristics of both *traditional* and *complex* systems. Researchers have demonstrated that in practice public agencies often operate with a mixture of bureaucratic organizational hierarchies (*traditional systems management*), and partnerships and networks (*complex systems management*).

For A&H, the extent to which one approach or the other is favored should depend on the nature of the project, the task and the system's environment. A *traditional management* approach is likely to be most effective where tasks have clear, short term goals, and are to be implemented in accordance with already established protocols and procedures. As for example, implementing environment review protocols for UCH. Being under the umbrella of a public agency's bureaucratic structure and *traditional management* system approach should ensure accountability, equity, ethical, and appropriate professional practices (Haynes 2008; Reyer and Gihani 2010; Rhodes et al. 2011).

For UCH special projects, such as the six UCH sites investigated for this study, with changing long-term goals and uncertain resources, a *complex management* approach is more appropriate and effective. Implementing public policy for such UCH projects is likely to be beyond A&H's internal resources. To progress these projects needs a network system to draw in and access a wide range of participants, resources, skills, expertise, facilities, and funding. The role of the A&H conservation manager as a project leader would be to guide and co-ordinate rather than direct the project network.

A day-to-day challenge for A&H conservation managers tasked with implementing public policy for UCH in North Carolina effectively is that they may have to operate simultaneously within *traditional* organizational systems and *complex* project systems. For A&H managers to implement legislated public policy and their conservation management responsibilities for the state's UCH both *traditional* and *complex* management approaches are needed. Also, there are the geographical and logistical challenges presented by a central A&H in Raleigh, versus the UCH sites as a resource to be managed which can be over 100 miles away.

Conservation management of UCH through establishing local *hubs* across the coastal region would be one way to take advantage of both central and local expertise and facilities. Designated hubs would have special facilities/or responsibilities but be available to all. For example, A&H's QAR Lab in Greenville, located at East Carolina University, could be a region wide center for archaeological and museum object conservation, research and education. Ways in which *traditional* management versus *complex* management approaches might then operate at the same time are illustrated in Figure 11.5 – red lines represent *traditional* management systems and central control, and blue dotted lines represent *complex* management system networks and partnerships. This mixed management framework would also facilitate conservation management

of UCH in future as an integral part of North Carolina's *place* and *people* - rather than as isolated archaeological sites in underwater environments.

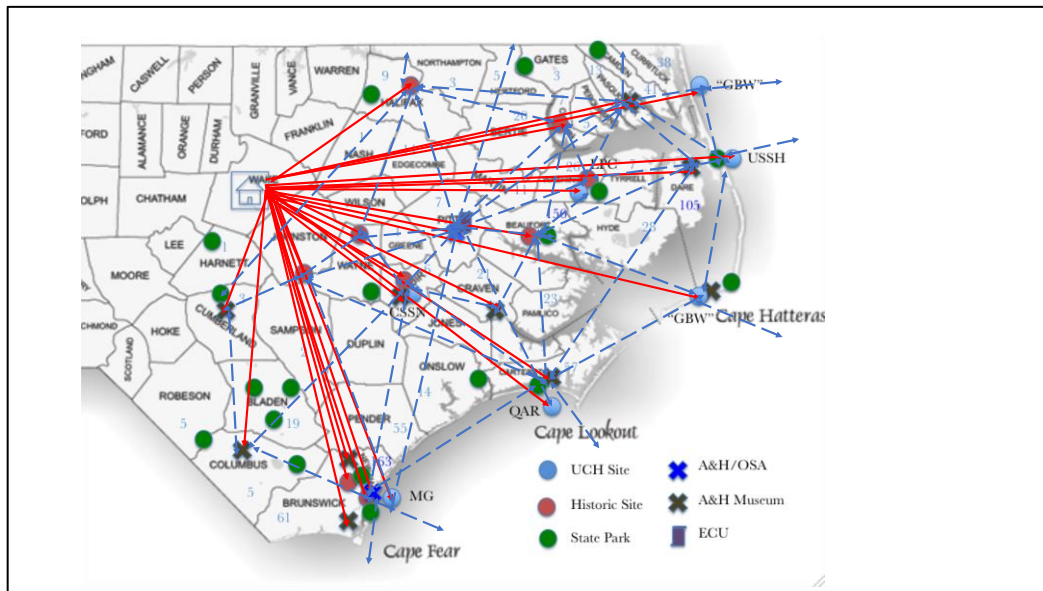


FIGURE 11.5. A proposed hubs approach for future conservation management of North Carolina's UCH. Solid red lines – indicate traditional management system out of A&H in Raleigh. Dashed blue lines indicate complex adaptive system management networks and partnerships. Sun icons indicate possible locations of UCH management hubs.(Figure by author, data sources for locations: NC PED (2012); *Sites Database* (NC A&H/OSA/UAB 2011); base map: https://www.ncpedia.org/sites/default/files/images/enc/map09_lg.png).

Conclusion

For conservation of material cultural heritage, Mason and Avrami (2002:15) identified a need for integrated research that includes management, social contexts, and technical aspects to better understand factors influencing conservation actions. Most conservation research has focused on technical aspects. Little research has focused on understanding the organizations within which conservation actions for UCH are taken (Firth 1996; Hannahs 2003; Ransley 2007). Conservation of any material cultural heritage is an ongoing process if longevity, usability, and value of a particular find or site are to continue into the indefinite future (Appelbaum 2007). Torre (2005:3) identified an information gap between theory and practice of application to

specific cases, and a need for critical analyses of actual management practice. This investigation of a public agency and six UCH sites as case studies helps fill this information gap.

This study investigated the nature and behavior of the system in North Carolina within which managers in A&H have implemented public policy to conserve the state's UCH since the early 1960s. It may be obvious from a professional conservation perspective what actions need to be taken to protect and preserve physical remains of the past. If remains are in state waters deciding what conservation actions to take, what resources to allocate, and for which sites, however, lies *beyond the waters' edge* with state public agency managers. In 2003, the state's public agency for Archives and History celebrated its first 100 years of providing "History for All the People" (Wegner 2003). This study has elucidated the actions of all people (public, political, and professional) necessary for effective conservation management of North Carolina's underwater cultural heritage; in order to preserve and protect it as part of our state's history.

REFERENCES

Abbott, Lawrence E.

- 2011 The Office of State Archaeology Sea Level Rise Project: Initial Results and Recommendations Concerning the Adaptation of Cultural Resources to Climate Change. A Report to North Carolina Department of Cultural Resources Regarding the Potential Effects of Sea Level Rise on Archaeological Sites in the Coastal Plain of North Carolina. Manuscript, North Carolina Department Natural and Cultural Resources, Office of State Archaeology, Raleigh, NC.

American Institute for Conservation (AIC)

- 2003 Defining the Conservator: Essential Competencies. American Institute for Conservation of Historic and Artistic Works. AIC, Washington D.C.

Albertson, Mike

- 1965a Sunken Blockade Runner Center of Court Case. *Wilmington Morning Star* 24 June:1-2. Wilmington, NC.
- 1965b Civil War Ship Salvage Banned. *Wilmington Morning Star* 8 July:1-2. Wilmington, NC.

Allegood, J.

- 1991 Site of Sunken Ship Becomes Monument. *The News & Observer* 24 November: C1. Raleigh, NC.
- 1998a Museum May Save Ill-fated CSS Neuse. *The News & Observer* 22 March: B1. Raleigh, NC.
- 1998b State Still Wants Old Ship Moved. *The News & Observer* 25 March: A3. Raleigh, NC.
- 1998c Small Town Wants Remains of Civil War Gunboat. *The News & Observer* 23 April: A3. Raleigh, NC.
- 1999 Confederate Gunboat to be Highlight of Museum. *The News & Observer* 31 May: A3. Raleigh, NC.

Anderson, D.

- 2008 Grant Awarded to CSS Neuse Foundation. *The Free Press* 16 January. Kinston, NC.
- 2009a On the Way: State Officials Laying the Groundwork for CSS Neuse Gunboat Museum Downtown. *The Free Press* 5 February. Kinston, NC.
- 2009b Artifacts Aweigh: Designers and State Officials Gather to Kick off Design of CSS Neuse Museum. *The Free Press* 10 February. Kinston, NC.
- 2009c The Boat Gets a Gun: CSS Neuse Foundation Obtains Gun for Ironclad Replica. *The Free Press* 26 March. Kinston, NC.
- 2009d Work Proceeds on CSS Neuse Museum: Money for Project is Secure Despite State Budget Crunch. *The Free Press* 20 July. Kinston, NC.
- 2010 Plans Unveiled for CSS Neuse Gunboat Museum. *The Free Press* 29 October. Kinston, NC.
- 2011 State Local Officials Break Ground on CSS Neuse Museum. *The Free Press* 22 April. Kinston, NC.
- 2012 CSS Neuse Moves to Permanent Downtown Home Saturday. *The Free Press* 24 June. Kinston, NC.

Anderson, Philip

- 1999 Complexity Theory and Organization Science. *Organization Science* 10(3):216-232.

- Anderson, Ruth, A., Benjamin F. Crabtree, David, J. Steele, and Reuben R. McDaniel, Jr.
2005 Case Study Research: The View from Complexity Science. *Qualitative Health Research* 15(5):669-685.
- Appelbaum, B.
2007 *Conservation Treatment Methodology*. Butterworth-Heinemann, Oxford, UK.
- Appleby, P.
1945 Government is Different. In *Classics of Public Administration*, J.M. Shafritz, and A.C. Hyde, editors, 2008, pp. 119-123. Wadsworth, Boston, MA.
- Arnott, Stephanie, H.L., Justin K. Dix, Angus I. Best, and David J. Gregory
2005 Imaging of Buried Archaeological Materials: The Reflection Properties of Archaeological Wood. *Marine Geophysical Researches* 26:135-144.
- Avrami, Erica, Randall Mason, and Marta de la Torre
2000 *Values and Heritage Conservation*. The Getty Conservation Institute, Los Angeles, CA.
- Babits, Lawrence E.
2002 Maritime Archaeology in North Carolina. In *International Handbook of Underwater Archaeology*, Carol V. Ruppe and Janet F. Barstad, editors, pp. 119-126. Kluwer Plenum, College Station, TX.
- Bak, Per and Maya Paczuki
1995 Complexity, Contingency, and Criticality. *Proceedings National Academy of Science* 92: 6689-6696.
- Baradello, Luca
2014 An Improved Processing Sequence for Uncorrelated Chirp Sonar Data. *Marine Geophysical Research* 35:337-344.
- Barkman, Lars
1977 Conservation of finds. In Papers from the First Southern Hemisphere Conference on Maritime Archaeology, Perth, Western Australia. Oceans Society, Australia.
1978 Conservation of rusty iron objects by hydrogen reduction. In *Corrosion and metal artifacts - A Dialogue Between Conservators and Archaeologists and Corrosion Scientists*, F.B. Brown, H.C. Burnett, W.T. Chase, M. Goodway, J. Kruger, and M. Pourbaix, editors, Special Publication 479 pp.156-166. U.S. Department of Commerce/National Bureau of Standards, Washington D.C.
- Barto, Arnold, J. III, and Carl J. Clausen
1975 A Magnetometer Survey with Electronic Positioning Control and Calculator-Plotter System. *Historical Archaeology* 9:26-40.
- Barnes, Jay
2013 *North Carolina's Hurricane History*. The University of North Carolina Press, Chapel Hill, NC.
- Beatley, Timothy, David J. Brower, and Anna K. Schwab
2002 *An Introduction to Coastal Zone Management*. 2nd edition. Island Press, Washington D.C.
- Bederman, David J.
2006 Congress Enacts Increased Protections for Sunken Military Craft. *The American Journal of International Law* 100(3):649-663.
- Benz, Marion and Anna Katrien Liedmeier
2007 Archaeology and the German Press. In *Archaeology and the Media*, Timothy Clack and Marcus Brittain, editors, pp. 154-173. Left Coast Press Inc. CA.

- Berducou, M.
1990 Introduction to Archaeological Conservation. In *Historical and Philosophical Issues in the Conservation of Cultural Heritage*, N.S. Price, M.K. Talley Jr., and A.M. Vaccaro, editors, 1996, pp. 248-259. Getty Conservation Institute, Los Angeles, CA.
- Berkes, Fikret
2006 From Community-Based Resource Management to Complex Systems: The Scale Issue and Marine Commons. *Ecology and Society* 11(1):45-60.
- Bernstein, David J., Mark Wilde-Ramsing, Christopher W. Freeman, and Benjamin W. Summers
2015 Shallow Water Hydrographic Surveys in Support of Archaeological Site Preservation: *Queen Anne's Revenge* Site, North Carolina. *U.S. Hydro* 2015.
- Beta Analytic Inc.
1987a Radiocarbon Dating Analyses for Lake Phelps Canoes. Report to North Carolina Department Cultural Resources, Office State Archaeology, Raleigh, NC, from Beta Analytic Inc. 22 January 1987.
1987b Radiocarbon Dating Analyses for Lake Phelps Canoes. Report to North Carolina Department Cultural Resources, Office State Archaeology, Raleigh, NC, from Beta Analytic Inc. 10 July 1987.
- Bintliff, John
2006 Time, Structure, and Agency: The Annales, Emergent Complexity, and Archaeology. In *A Companion to Archaeology*, John Bintliff, editor, pp.174-194. Blackwell Publishing Ltd, Oxford, UK.
- Björdal, Charlotte, Gjelstrup
2012 Microbial Degradation of Waterlogged Archaeological Wood. *Journal of Cultural Heritage* 13(3):118-122.
- Björdal, Charlotte, and David Gregory (editors)
2011 *WreckProtect Decay and Protection of Archaeological Wooden Shipwrecks*. European Commission, Directorate Environment, FP7. Information Press, Oxford, UK.
- Björdal, Charlotte Gjelstrup, and Thomas Nilsson
2008 Reburial of Shipwrecks in Marine Sediments: A Long-Term Study on Wood Degradation. *Journal of Archaeological Science* 35:862-872.
- Blackburn, Marion
2012 A Cargo Twice Dug. *Archaeology* September/October:39-43.
- Boesten, Eke
2002 *Archaeological and/or Historic Valuable Shipwrecks in International Waters*. T.M.C. Asser Press, The Hague, Netherlands.
- Bolman, Lee. G. and Deal, Terrence, E.
2008 *Reframing Organizations: Artistry, Choice and Leadership*, 4th edition. Jossey-Bass, San Francisco, CA.
- Bondareff, Joan
2000 The Abandoned Shipwreck Act: Useful Tool for Preservation or Paper Tiger? *Maritime Reporter and Engineering News* October: 38-41.
- Brand, Ellis
1718 Letter from Captain Ellis Brand to the Board of Admiralty, July 12, 1718. Manuscript, Records of the Admiralty, Naval Forces, Royal Marines, Coastguard, and Related bodies, ADM 1/472, National Archives, Kew, London, UK.

- Braovac, Susan, Caitlin M.A. McQueen, Malin Sahlstedt, Hartmut Kutzke, Jeannette J. Lucejko, Torunn Klokkernes
 2018 Navigating Conservation Strategies: Linking Material Research on Alum-Treated Wood from the Oseberg Collection to Conservation Decisions. *Heritage Science* 6(1):1-16.
- Bright, Leslie S.
 1969 Experiments on Impregnating Water-Logged Wood from the 1864 Shipwreck, C.S.S. *Neuse*. Manuscript, North Carolina Department Cultural Resources, Office State Archaeology, Underwater Archaeology Branch, Kure Beach, NC.
- 1977 *The Blockade Runner Modern Greece and her Cargo*. North Carolina Department Cultural Resources, Division Archives and History, Raleigh, NC.
- 1987 Candied Canoes of North Carolina. In *Proceedings of the Underwater Archaeology Society for Historical Archaeology Conference*, 1987, pp. 89-91.
- Bright, Leslie S., William H. Rowland, and James C. Bardon
 1981 *C.S.S. Neuse A Question of Iron and Time*. North Carolina Department of Cultural Resources, Division of Archives and History, Raleigh, NC.
- Broadwater, John, D.
 2012 *USS Monitor A Historic Ship Completes its Final Voyage*. Texas A&M University Press, College Station, TX.
- Brooks, Barbara Lynn, Ann M. Merriman, and Madeline P. Spencer
 2009 Bibliography of North Carolina Underwater Archaeology. Manuscript North Carolina Department Cultural Resources, Archives and History, Office State Archaeology, Underwater Archaeology Branch, Kure Beach, NC.
- Brooks, Baylus C.
 2012 Re-conservation of Artifacts from the CSS *Neuse*. *Stem to Stern* 29:13.
- Brown, Daniel, Mark
 2013 The Corolla Wreck Exposed: Historical Archaeological Analysis of North Carolina's Oldest Shipwreck. Master's thesis, Department of History, Maritime Studies, East Carolina University, Greenville, NC.
- Burke, Cheryl
 2019 QAR Suit Appealed to SCOTUS. *Carteret News-Times* 12 January. Beaufort, NC.
- Butler, Lindley S.
 2000 *Pirates, Privateers, and Rebel Raiders of the Carolina Coast*. UNC Press, Chapel Hill, NC.
- 2001 The Quest for Blackbeard's Queen Anne's Revenge. *Tributaries* 11: 39-47. North Carolina Maritime History Council, Beaufort, NC.
- 2007 Proprietary North Carolina: Politics, Shipping and Pirates. Manuscript. Queen Anne's Revenge Shipwreck Project Research Report and Bulletin Series, QAR-R-07-03, North Carolina Department of Cultural Resources, Office of Archives and History, Office of State Archaeology, Raleigh, NC.
- 2018 North Carolina 1718: The Year of the Pirates. *North Carolina Historical Review*, Volume XCV 2:125-146.
- Byrne, David, and Gill Callaghan
 2014 *Complexity Theory and the Social Sciences: The State of the Art*. Routledge, Abingdon, UK.
- Cairney, Paul
 2012 Complexity Theory in Political Science and Public Policy. *Political Studies Review* 10:346-358.

- Cameron, Fiona, and Sarah Mengler
 2009 Complexity, Transdisciplinary and Museum Collections Documentation, Emergent Metaphors in a Complex World. *Journal of Material Culture* 14(2):189-218.
- Campbell, Peter, B.
 2009 The Development of Confederate Ship Construction: An Archaeological and Historical Investigation of Confederate Ironclads Neuse and Jackson. Master's thesis, Department of History, Maritime Studies, East Carolina University, Greenville, NC.
- Cantelas, Frank
 1997 Report on the SHARPS system used on the *Queen Anne's Revenge*. Report to North Carolina Department Cultural Resources, Archives and History, Office of State Archaeology, Underwater Archaeology Branch, Kure Beach, NC, from Department of History, Program in Maritime History and Nautical Archaeology, East Carolina University, Greenville, NC.
- Caple, Chris
 2008 Preservation in situ: the future for archaeological conservators? Contributions to 2008 International Institute for Conservation (IIC) Congress, pp.214-217. IIC, London, UK.
- Carlisle, Ysanne
 2011 Complexity Dynamics: Managerialism and Undesirable Emergence. *Journal of Medical Marketing: Device, Diagnostic and Pharmaceutical Marketing* 11(4): 284-293.
- Carlisle, Paul, R. and Clayton, M. Christensen
 2004 The Cycle of Theory Building in Management Research. Harvard Business School Working Paper Series, 2005-2003, #05-057.
- Cashin, Goodwin, E., John R. Dorney, Curtis, J., Jackson
 1992 Wetland Alteration Trends on the North Carolina Coastal Plain. *Wetlands* 12(2):63-71.
- Caston, G.F.
 1979 Wreck Marks: Indicators of Net Sand Transport. *Marine Geology* 33:193-204.
- Caudill, Jessica
 2013 North Carolina Material Culture: An Analysis of the Excavation, Conservation and Display of the Confederate Ironclad CSS Neuse. Master's thesis, Department of History, Maritime Studies, East Carolina University, Greenville, NC.
- Christensen, B.B.
 1970 *The conservation of waterlogged wood in the National Museum of Denmark*. National Museum, Copenhagen, Denmark.
- Christensen, Mikkil, Hartmut Kutzke, and Finn Knut Hansen
 2012 New materials used for the consolidation of archaeological wood-past attempts, present struggles, and future requirements. *Journal of Cultural Heritage* 13(3):183-190.
- Cilliers, Paul
 2001 Boundaries, Hierarchies and Networks in Complex Systems. *International Journal of Innovation Management* 5(2):135-147.
- Claggett, Stephen, R.
 1995 First Immigrants: Native American Settlement of North Carolina. *Tar Heel Junior Historian* Spring 1995, North Carolina Museum of History, Raleigh, NC. Accessed February 2019
<https://www.ncpedia.org/history/early/native-settlement>.

- Clarke Shortley, V.
2008 CSS *Neuse* to get new home: \$3.5M-project should be funded by state legislature. *The Free Press* 8 July. Kinston, NC.
- Cohn, Arthur B. and Joanne M. Dennis
2011 Maritime Archaeology, The Dive Community and Heritage Tourism. In *Oxford Handbook of Maritime Archaeology*, Alexis Catsambis, Ben Ford, Donny L. Hamilton, (editors), pp. 1055-1081. Oxford University Press, Oxford, UK.
- Cox, Starr Nicole
2008 Enfield Rifles: The Composite Conservation of our American Civil War Heritage. Master's thesis, Department Anthropology, Texas A&M University, College Station, TX.
- Creswell, John W.
2009 *Research Design, Qualitative, Quantitative and Mixed Methods Approaches*. Sage, Thousand Oaks, CA.
- Cronyn, J. M.
1990 *The Elements of Archaeological Conservation*. Routledge, London, UK.
- Curci, Jessica Lee
2006 Log-boats of the Southeastern United States: Investigating the Question of Form. Doctoral dissertation, Coastal Resources Management Program, East Carolina University, Greenville, NC.
- Curlee, Wanda, and Robert L. Gordon
2011 *Complexity Theory and Project Management*. Wiley & Sons, Inc. Hoboken, NJ.
- The Daily Picayune*
1862 The Firing at New Inlet this Morning – Vessel Ashore. *The Daily Picayune* 13 July. New Orleans, LA.
- Davies, G.
2009 Planning Mitigation and Archaeological Conservation, Resource Assessment. Research Department Report Series 65-2009. English Heritage, London, UK.
- DeBry, John
1999 Report on Archival Research Pertaining to the Concorde of Nantes and its Capture by Pirates in 1717. Manuscript, North Carolina Department of Cultural Resources, Archives and History, Office of State Archaeology, Raleigh, NC.
- DeCicco, Gabriel
1988 A Public Relations Primer. *American Antiquity* 53(4):840-856.
- Delgado, James P. (editor)
1997 *Encyclopaedia of Underwater and Maritime Archaeology*. British Museum Press, London, UK.
- Demas, Martha
2002 Planning for Conservation and Management of Archaeological Sites. In *Management Planning for Archaeological Sites*, J.M. Tuetonico, and G. Palumbo, editors, pp.27-54. The Getty Conservation Institute, Los Angeles, CA,
- Denard, Hugh
2012 A New Introduction to the London Charter. In *Paradata and Transparency in Virtual Heritage* Digital Research in the Arts and Humanities Series, A. Bentkowska-Kafel, D. Baker, and H. Denard, editors, pp.57-71. Ashgate, London, UK.

- Doneus, Michael, Nives Doneus, Christian Briese, Michael Pregesbauer, Gottfried Mandlbürger, and Geert Verhoeven
 2013 Airborne Laser Bathymetry – Detecting and Recording Submerged Archaeological Sites from the Air. *Journal of Archaeological Science* 40:2136-2151.
- Dooley, Kevin J., and Andrew H. Van de Ven
 1999 Explaining Complex Organizational Dynamics. *Organization Science* 10(3):358-372).
- Dosset, Pierre
 1718a April 27, 1718. A comparu le sieur Dosset . . . [Vérification et addition de la declaration de Ernaud lieutenant pour La Concorde pillée et prise par les forbans]. ADLA B 4578 folio 90v &s. In Report to North Carolina Department Cultural Resources, Archives and History, Office of State Archaeology, Raleigh, NC, from Jaques Ducoin (2001:29).
- 1718b October 13, 1718. Rôle d’équipage du navire La Concorde de Nantes . . . voyage de 1717. ADLA 120 J337 fo 53. In Report to North Carolina Department Cultural Resources, Archives and History, Office of State Archaeology, Raleigh, NC, from Jaques Ducoin (2001:38-40).
- Drennan, Robert, D.
 2009 *Statistics for Archaeologists: A Common-Sense Approach*, 2nd edition. Springer, New York, NY.
- Ducoin, Jacques
 2001 Compte Rendu de Recherches dans les Archives Francaises sur le Navire Nantais La Concorde Capturé par des Pirates en 1717. Report to North Carolina Department Cultural Resources, Archives and History, Office of State Archaeology, Raleigh, NC.
- 2002 Les Pirates Noirs. Le Négrier Nantais la Concorde et le Pirate Anglais Edward Teach Dit Blackbeard. *Cahiers de Anneaux de la Mémoire de Nantes* 4: 89-106.
- Eastman, Jane
 1994 The North Carolina Radiocarbon Date Study (Part 1). *Southern Indian Studies* 42:1-58.
- English Heritage
 2008 *Conservation Principles, Policies & Guidance for the Sustainable Management of the Historic Environment*. English Heritage, London, UK.
- Ernaud, Francois
 1718 27 April 1718, A Comparu le Sieur François Ernaud... [La Concorde de Nantes, Pillée et Prise par les Forbans] ADLA B4578 fo 56v &s. In Report to North Carolina Department Cultural Resources, Archives and History, Office of State Archaeology, Raleigh, NC, from Jaques Ducoin (2001:27).
- Ernst, Howard R.
 2003 *Chesapeake Bay Blues, Science, Politics, and the Struggle to Save the Bay*. Rowan and Littlefield, Lanham, MD.
- Fagan, Brian
 1977 Genesis 1.1: Or, Teaching Archaeology to the Great Archaeology-Loving Public. *American Antiquity* 42(1):119-125.
- Fayetteville Observer*
 1862 Firing at New Inlet – Vessel Ashore. *Fayetteville Observer* 30 June: Issue 2352. Fayetteville, NC.
- Feuquières, M. de
 1717 10 Décembre 1717, Affaire du Capitaine Dosset, de Nantes. Martinique. Correspondences à l’arrivée. AN Col C8A 23 (1717) fo 39. In Report to North Carolina Department Cultural Resources, Archives and History, Office of State Archaeology, Raleigh, NC, from Jaques Ducoin (2001:20-21, 61).

- 1718 12 Mai 1718. Plaintes de l'Armateur Montaudouin à Propos de la Prise par les Forbans de son Navire La Concorde. AN Col C8A 24 (1718) fo 150. In Report to North Carolina Department Cultural Resources, Archives and History, Office of State Archaeology, Raleigh, NC, from Jaques Ducoin (2001:30).
- Firth, Anthony
1996 Theorizing the Management of Archaeology Underwater. *Historical Archaeology* 30(2): 85-92.
- Foecke, Tim, Li Ma, Matthew A. Russell, David L. Conlin, and Larry E. Murphy
2010 Investigating Archaeological Site Formation Processes on the Battleship USS Arizona using Finite Element Analysis. *Journal of Archaeological Science* 37(5):1090-1101.
- Fopp, Michael, A.
1997 *Managing Museums and Galleries*. Routledge, London, UK.
- Forte, Maurizio
2011 Cyber-Archaeology: Notes on the Simulation of the Past. *Virtual Archaeology Review* 2(4): 7-18.
- Forstall, Richard, L.
1996 *Population of the States and Counties of the United States 1790 to 1990 From the Twenty-One Decennial Censuses*. U.S. Department of Commerce Bureau of the Census, Washington, D.C.
- Freeland, Chelsea Rachelle
2014 Modern Greece: Values of a Civil War Blockade-Runner. Master's thesis, Department of History, Maritime Studies, East Carolina University, Greenville, NC.
- The Free Press*
2007 Neuse II Group Receives Non-Profit Status. *The Free Press* 2 May. Kinston, NC.
- 2012 CSS Neuse Moves to Permanent Downtown Home Saturday. *The Free Press* 24 June. Kinston, NC.
- Friday, Joe, D. Jr.
1988 A History of the Wreck of the USS *Huron*. Master's thesis, Department of History, Maritime Studies, East Carolina University, Greenville, NC.
- Fuller, Tony, and Min Qingwen
2013 Understanding Agricultural Heritage Sites as Complex Adaptive Systems: The Challenge of Complexity. *Journal of Resources and Ecology* 4(3):195-201.
- Gaus, J.M.
1947 The Ecology of Public Administration. In *Public Administration, Concepts and Cases*, R.J. Stillman, editor, pp.80-84. Wadsworth, Boston, MA.
- Geyer, Robert and Samir Rihani
2010 *Complexity and Public Policy A New Approach to 21st Century Politics, Policy and Society*. Routledge, London, UK.
- Giachi, G., C. Capretti, I.D. Donato, N. Macchioni, & B. Pizzo.
2011 New Trials in the Consolidation of Waterlogged Archaeological Wood with Different Acetone-Carried Products. *Journal of Archaeological Science* 38:2957-2967.
- Gilman, Michell J.
2015 Lake Phelps Dugout Log Canoes: Conservation, Retreatment, and Public Display. Masters' thesis, Department Anthropology, East Carolina University, Greenville, NC.

- Godfrey, Inger Nyström, Bergstrand Thomas, Hakan Petersson, Carola Bohm, Eva Christensson, Charlotte Gjelstrup, David Gregory, Ian MacLeod, Elizabeth Peacock, and Vicki Richards
 2012 The RAAR Project – Heritage Management Aspects on Reburial After Ten Years of Work. *Conservation and Management of Archaeological Sites* 14(1-4):360-371.
- Goodnow, F.J.
 1900 Politics and Administration. In *Classics of Public Administration*, 6th edition. J.M. Shafritz and A.C. Hyde, editors, pp. 28-30. Wadsworth, Boston, MA.
- Gould, Richard A.
 2011 The Archaeology and Social History of Ships, 2nd edition. Cambridge University Press, Cambridge, UK.
- Grattan, David
 2000 Wood (Waterlogged) Conservation. In *Archaeological Method and Theory*, Linda Ellis, editor, pp. 665-666. Garland Publishing, Inc. New York, NY.
- Green, Jeremy
 2014 The Application of Aerial Magnetometers in Maritime Archaeology. *The International Journal of Nautical Archaeology* 43(2):436-452.
- Gregory, David
 1998 Re-burial of Timbers in the Marine Environment as a Means of their Long-term Storage: Experimental Studies in Lyn's Sands, Denmark. *The International Journal of Nautical Archaeology* 27(4):343-358.
 2009 In Situ Preservation of Marine Archaeological Sites: Out of Sight but Not Out of Mind. In *In-Situ Conservation of Cultural Heritage: Public, Professionals and Preservation*, Vicki Richards, and Jennifer McKinnon, editors, pp.1-16. Past Foundation and Flinders University, Australia.
 2010 Shipworm Invading the Baltic? *The International Journal of Nautical Archaeology* 39(2):431-431.
- Gregory, David, and Henning Matthieson
 2012 Nydam Mose: In Situ Preservation at Work. *Conservation and Management of Archaeological Sites* 14(1-4):479-486.
- Gregory, David, Poul Jensen, and Kristiane Straetkvern
 2012 Conservation and in situ preservation of wooden shipwrecks from marine environments. *Journal of Cultural Heritage* 13(3): S139-S148.
- Grieve, Susanne
 2011 Modern Greece Collection Condition Survey Report. Report to North Carolina Department Cultural Resources, Archives and History, Office of State Archaeology, Underwater Archaeology Branch, Kure Beach, NC, from Department of Anthropology, East Carolina University, Greenville, NC.
- Griffin Anna
 2002 Gunboat Waits at Edge of Ruin – CSS Ram Neuse, Beset from Start, Could Lose Money-and-Time Battle. *Charlotte Observer* 14 April:1B. Charlotte, NC.
- Grobman, Gary, M.
 2005 Complexity Theory: A New Way to Look at Organizational Change. *Public Administration Quarterly* 29(3):350-382.
- Grussing, Valerie
 2009 Reanimating the Graveyard: Heritage Tourism Development of North Carolina Shipwrecks. Doctoral dissertation, Coastal Resources Management Program, East Carolina University, Greenville, NC.

- Gulick, L.
1937 Notes on the Theory of Organization. In *Classics of Public Administration*, 6th edition, J.M. Shafritz and A.C. Hyde, editors, pp. 79-87. Wadsworth, Boston, MA.
- Hall, E.T.
1966 The Use of the Proton Magnetometer in Underwater Archaeology. *Archaeometry* 9:32-34.
- Hamilton, D.L.
1996 *Basic Methods of Conserving Underwater Archaeological Material Culture*. Department of Defense, Washington D.C.
- Hampton, J.
2010a Plan in Works to Salvage Remnants of N.C. Shipwreck. *The Virginian-Pilot* 31 March. Norfolk, VA.
2010b Crew Works to Save Oldest-Known Shipwreck on N.C. Coast. *The Virginian-Pilot* 7 April. Norfolk, VA.
2010c Colonial-Era Shipwreck Moved to Hatteras Museum. *The Virginian-Pilot* 20 July. Norfolk, VA.
2011 Preserving a Shipwreck. *The Virginian-Pilot* 30 January. Norfolk, VA.
2012 Reading Between the Wreckage. *The Virginian-Pilot* 28 October. Norfolk, VA.
2015 Is this 2008 Find the 1652 Wreck of British Vessel? *The Virginian-Pilot* 8 November. Norfolk, VA.
- Handy, Charles B.
1985 *Understanding Organizations*. Penguin Books, London, UK.
- Hannahs, Todd
2003 Underwater Parks Versus Preserves: Data or Access. In *Submerged Cultural Resource Management Preserving and Interpreting our Sunken Maritime Heritage*, James D. Spirek, and Della A. Scott-Ireton, editors, pp.5-16. Kluwer/Plenum, New York, NY.
- Harpster, Matthew,
2009 Keith Muckelroy: Methods, Ideas and Maritime Archaeology. *Journal Maritime Archaeology*, 4:67-82.
- Harris, W. Burleigh, and Richard A. Laws,
1997 Paleogene stratigraphy and sea-level history of North Carolina Coastal Plain: global coastal onlap and tectonics. *Sedimentary Geology* 108:91-120.
- Hunt, James B.
1997 Quote in Preface of Wilde-Ramsing and Lusardi (1999).
- Hauck, Chelsea
2011 Removing Sucrose: Experimentation on the Removal of Treated Wooded Artifacts. Report for Advanced Conservation Class at East Carolina University. Manuscript copy on file, North Carolina Department Natural and Cultural Resources, A&H/OSA/QAR Lab, Greenville,NC. Original on file, East Carolina, University, Greenville, NC.
- Hauke, Jan, and Tomasz Kossowski
2011 Comparison of Values of Pearson's and Spearman's Correlation Coefficients on the Same Sets of Data. *Quaestiones Geographicae* 30(2):87-93.
- Hayes, Margaret
2004 Office of Ocean Affairs: Protection of Sunken Warships, Military Aircraft and Other Sunken Government Property. Federal Register February:69(24):5647-56481. Accessed <http://edocket.access.gpo.gov/2004/042488.htm> on 29 April 2009.

- Haynes, Philip
2003 Managing Complexity in the Public Services. Open University Press, Maidenhead, UK.
- 2008 Complexity Theory and Evaluation in Public Management. *Public Management Review* 10(3): 401-419.
- Heath, Ralph C.
1975 Hydrology of the Albemarle-Pamlico Region of North Carolina. US Geological Survey, Water Resources Investigation 9-75.
- Heclo, Hugh
1978 Issue Networks and the Executive Establishment. In *Public Administration Concepts and Cases*. Richard J. Stillman II, editor, pp. 413-422. Wadsworth, Boston, MA.
- Henry, Nathan, and Sarah Watkins-Kenney
2010 Collation of emails referring to the Corolla Wreck ("George Browne" wreck) on file at North Carolina Department Natural and Cultural Resources, Archives and History, Office of State Archaeology, Underwater Archaeology Branch, Fort Fisher, Kure Beach, NC.
- Hocker, E. G. Almkvist, and M. Sahlstedt
2012 The Vasa experience with polyethylene glycol: A conservator's perspective. *Journal of Cultural Heritage* 13(3): S175-S182.
- Hoffman, P.
2001 To be and To Continue being a Cog. The Conservation of the Bremen Cog of 1380. *The International Journal of Nautical Archaeology* 30:129-140
- Holden, J., L. J. West, A.J. Howard, E. Maxfield, I. Panter, and J. Oxley
2006 Hydrological Controls of In Situ Preservation of Waterlogged Archaeological Deposits. *Earth-Science Reviews* 78:59-83.
- Holland, Ron
2006 Demography. In *Encyclopedia of North Carolina*, William S. Powell, (editor), pp. 337-338. University of North Carolina Press, Chapel Hill, NC.
- Holley, James Kevin
1989 Age and Lake Margin Migrations of Lake Phelps, Washington County, North Carolina. Master's thesis, East Carolina University, Greenville, NC.
- Horn, Thomas, Wilde
2012 Archaeological Research Permit Application to Naval History and Heritage Command. Copy at North Carolina Department of Natural and Cultural Resources, Archives and History, Office of State Archaeology, Underwater Archaeology Branch, Kure Beach, NC.
- 2014 Determining Seasonal Corrosion Rates in Ferrous-Hulled Shipwrecks: A Case Study of the USS *Huron*. Master's thesis, Department of History, Maritime Studies Program, East Carolina University, Greenville, NC.
- Hotz, A
2011 Underwater Archaeology Team Helps preserve N.C. Maritime History. *Star News* 18 February, Wilmington, NC.
- Houchin, K., and D. MacLean
2005 Complexity Theory and Strategic Change: An Empirically Informed Critique. *British Journal of Management* 16:145-166.

- Hoyt, Joseph, James P. Delgado, Bradley Barr, Bruce Terrell, and Valerie Grussing
 2014 *"Graveyard of the Atlantic" An Overview of North Carolina's Maritime Cultural Landscape*. NOAA Office of National Marine Sanctuaries Maritime Heritage Program Series 4, Silver Spring, MD.
- Hutchings, Jeremy, and May Cassar
 2006 A Soft System Framework for the Conservation Management of Material Cultural Heritage. *Syst Pract Act Res* 19:201-216.
- Institute for Conservation (ICON)
 2009 A Brief Guide to the Principles of Archaeological Conservation. Institute for Conservation (ICON), Archaeology Group, London, UK.
- Inman, D.L., and C.E., Nordstrom,
 1971 On the Tectonic and Morphologic Classification of Coasts. *Journal of Geology* 79(1):1-21.
- International Council of Museums Conservation Committee (ICOM-CC)
 1984 The Conservator-Restorer: A Definition of the Profession. International Council of Museums Conservation Committee, Paris, France. Document accessed January 2019 at <http://www.icom-cc.org/47/about/definition-of-profession-1984/#.XJ9d7KYpAcg>
- Jackson, Sandy
 1995 The Closing of New Inlet (The Rocks) 1870-1881. FPHPS Newsletter, November 1995. Accessed at <http://federal-point-history.org> August 2017.
- Jameson, John, H. and Della A. Scott-Ireton
 2007 *Out of the Blue: Public Interpretation of Maritime Cultural Resources*. Springer, New York, NY.
- Jensen, Poul, and David J. Gregory
 2006 Selected Physical Parameters to Characterize the State of Preservation of Waterlogged Archaeological Wood: A Practical Guide for their Determination. *Journal of Archaeological Science* 33(4):551-559.
- Johnson, Captain Charles
 1724 *A General History of the robberies and murders of the most notorious Pyrates*. Reprint 1988. Lyons Press, New York, NY.
- Johnston, Frontis, W.
 1979 The North Carolina Historical Commission, 1903-1978. In *Public History in North Carolina, 1903-1978: Proceedings of the 75th Anniversary*, Jeffrey J. Crow, editor, pp.1-15. North Carolina Office of Archives and History, Raleigh, NC.
- Jones, Mark
 2003 *For Future Generations: Conservation of a Tudor Maritime Collection*. Mary Rose Trust, Portsmouth, UK.
- Jordan, Brian, A.
 2001 Site Characteristics Impacting the Survival of Historic Waterlogged Wood: A Review. *International Biodeterioration & Biodegradation* 47(1):47-54.
- Kapelouzou, I.
 2012 The Inherent Sharing of Conservation Decisions. *Studies in Conservation* 57(3):172-182).
- Kaufman, Herbert
 2001 Major Players: Bureaucracies in American Government. *Public Administration Review* 61(1): 18-42.
- Keene, Suzanne
 1996 *Managing Conservation in Museums*. Butterworth Heinemann Oxford, UK.

- Kennedy, Anthony, and Edward Ross Pennington
 2014 Conservation of Chemically Degraded Waterlogged Wood with Sugars. *Studies in Conservation* 59(3):194-201.
- Kenyon, Kimberly P., John W. Morris III, and Greg O. Stratton
 2017 Fall 2015 Field Report for Archaeological Site 31CR314, Blackbeard's Queen Anne's Revenge. Manuscript, North Carolina Department Natural and Cultural Resources, Office of State Archaeology. Raleigh, NC.
- King, Thomas, F.
 2004 *Cultural Resource Law and Practice*, 2nd edition. Altamira Press, Lanham, MD.
- Kingdon, John W.
 1995 *Agendas, Policies, and Public Policies*. Longman, New York, NY.
 2003 *Agendas, Alternatives and Public Policies*. Longman, New York, NY.
- Klein, Martin
 2002 Side Scan Sonar. In *International Handbook of Underwater Archaeology*, Carol V. Ruppé, and Janet F. Barstad, editors, pp. 667-678. Kluwer Plenum, College Station, TX.
- Knowlton, Lisa Wyatt, and Cynthia C. Phillips
 2009 *The Logic Model Guidebook Better Strategies for Better Results*. Sage, Los Angeles, CA.
- Kraft, Michael E. and Scott R. Furlong
 2007 *Public Policy - Politics, Analysis and Alternatives*. CQ Press Washington D.C.
- Kuhn, Robert D.
 2002 Archaeology under a Microscope: CRM and the Press. *American Antiquity* 67(2):195-212.
- Larson, Norman
 1963 Salvage Operations Off Fort Fisher, North Carolina. Paper presented at Sixth National Assembly of Civil War Centennial Commission, 1963. Civil War Centennial Commission, Washington, DC.
- Laven, Daniel, Curtis Ventriss, Robert Manning, and Nora Mitchell
 2010 Evaluation U.S. National Heritage Areas: Theory, Methods and Application. *Environmental Management* 46:195-212.
- Lawrence, Richard W.
 1977 *The Modern Greece, 1859 – 1977*. Manuscript, North Carolina Department Cultural Resources, Archives and History, Office State Archaeology, Underwater Archaeology Branch. Kure Beach, NC.
 1982 Field Notes on a Magnetometer Survey of the CSS *Neuse* Site and an Investigation of Exposed Cultural Remains on a Portion of the Neuse River at Kinston, North Carolina. Manuscript, North Carolina Department Cultural Resources, Archives and History, Office State Archaeology, Underwater Archaeology Branch. Kure Beach, NC.
 1985a Recovery of a Dugout Log Canoe from Lake Phelps, November 1985. Manuscript, North Carolina Department Cultural Resources, Archives and History, Office State Archaeology, Underwater Archaeology Branch. Kure Beach, NC.
 1985b Underwater Archaeological Sites in the Wilmington Historical District, Addendum, National Register of Historic Places, Department of Interior, Nomination Form. Manuscript, North Carolina Department Cultural Resources, Archives and History, Office State Archaeology, Underwater Archaeology Branch. Kure Beach, NC.

- 1986 Inspection of Site 0002PHL, Lake Phelps, North Carolina, January 1986. Manuscript, North Carolina Department Cultural Resources, Archives and History, Office State Archaeology, Underwater Archaeology Branch. Kure Beach, NC.
- 1995 Managing Underwater Archaeological Resources in North Carolina. South Atlantic Ocean Management Workshop, pp 34-39. Division of Coastal Management, Raleigh, NC
- 1997 USS *Huron*. In *Encyclopaedia of Underwater and Maritime Archaeology*, James P. Delgado, editor, pp. 200-201. British Museum Press, London, UK.
- 2002 Preliminary Examination of Site 0040NUR: Possible Casemate Structure from the Confederate Ironclad, CSS Neuse, located in the Neuse River at Kinston, North Carolina. Manuscript, North Carolina Department Cultural Resources, Archives and History, Office State Archaeology, Underwater Archaeology Branch. Kure Beach, NC.
- 2003 From National Tragedy to Cultural Treasure: The USS *Huron* Historic Shipwreck Preserve. In *Submerged Cultural Resource Management: Preserving and Interpreting our Sunken Maritime Heritage*, James D. Spirek, and Della A. Scott-Ireton, editors, pp.59-69. Plenum, New York, NY
- 2004 Summary of Lake Phelps Fieldwork, 25 May to 27 May, 2004. Manuscript, North Carolina Department Natural and Cultural Resources, Archives and History, Office of State Archaeology, Underwater Archaeology Branch, Kure Beach, NC.
- 2008a Field Visit to Lake Phelps, 24 June and 25 June. Manuscript, North Carolina Department Natural and Cultural Resources, Archives and History, Office of State Archaeology, Underwater Archaeology Branch, Kure Beach, NC.
- 2008b An Overview of North Carolina Shipwrecks with an Emphasis on Eighteenth Vessel Losses at Beaufort Inlet. Queen Anne's Revenge Shipwreck Project Research and Bulletin Series, QAR-R-08-01. Manuscript, North Carolina Department of Cultural Resources, Archives and History, Office of State Archaeology. Raleigh, NC.
- 2011 Forty Years Beneath the Waves: Underwater Archaeology in North Carolina. In *Archaeology of North Carolina: Three Archaeological Symposia*, Charles R. Ewen, Thomas R. Whyte, and R.P. Stephen Davis, Jr, editors, Chapter 30:1-12. North Carolina Archaeological Council, Raleigh, NC.
- Lawson, John
1709 *A New Voyage to Carolina*. Reprint 1967, Hugh Talmage Lefler, editor. University of North Carolina Press, Chapel Hill, NC.
- Lazic, V., F. Colao, R. Fantoni, and V. Spizzicchio
2005 Recognition of Archaeological Materials Underwater by Laser Induced Breakdown Spectroscopy, *Spectrochimica Acta* 60:1014-1024.
- Lee, Robert E.
1995 *Blackbeard the Pirate: A Reappraisal of His Life and Time*. John F. Blair Publishing Co., Winston-Salem, NC.
- Levin, Simon, Tasos Xepapadeas, Anne-Sophie Crépin, Jon Norberg, Aart de Zeeuw, Carl Folke, Terry Hughes, Kenneth Arrow, Scott Barrett, Gretchen Daily, Paul Ehrlich, Nils Kautsky, Karl-Göran Mäler, Steve Polasky, Max Troell, Jeffrey R. Vincent, and Brian Walker
2012 Socio-Ecological Systems as Complex Adaptive Systems: Modeling and Policy Implications. *Environment and Development Economics* 18:111-132.

- Lipsky, M.
1980 Street-level bureaucracy: the critical role of street-level bureaucrats. In *Classics of Public Administration*, 6th edition, J.M. Shafritz, and A.C. Hyde, editors, 2008, pp. 404-411). Wadsworth, Boston, MA.
- Lorenz, Edward, N.
1993 *The Essence of Chaos*. The University of Washington Press, Seattle, WA.
- Lusardi, Wayne R.
1999 Do the Artifacts Identify the Beaufort Inlet Shipwreck as the Pirate Blackbeard's Flagship Queen Anne's Revenge? In *Underwater Archaeology Proceedings from the Society for Historical Archaeology Conference*, pp.123-132.
2000 The Beaufort Inlet Shipwreck Project. *The International Journal of Nautical Archaeology* 29(1):57-68.
2006 The Beaufort Inlet Shipwreck Artifact Assemblage. In *X-Marks the Spot: The Archaeology of Piracy*, Russell K. Skowronek and Charles R. Ewen, editors, pp.196- 218. University of Florida Press, Gainesville, FL.
- MacCleod, Ian
1982 The Formation of Marine Concretions on Copper and its Alloys. *The International Journal of Nautical Archaeology* 11(4): 267-275.
1996 In-situ Conservation of Cannon and Anchors on Shipwreck Sites. In *Conservation of Archaeological Sites and its Consequences*, Ashok Roy, and Perry Smith, editors, pp.111-115. International Institute for Conservation (IIC), London, UK.
1998 In-Situ Corrosion Studies on Iron Shipwrecks and Cannon: the Impact of Water Depth and Archaeological Activities in Corrosion Rates. In *Metal 98 Proceedings of the ICOM -CC Metals Working Group Conference, Draguignan-Faginère France 1998*, W. Mourey, and L. Robbiola, editors, pp.116-124. James & James, London.
2006 Corrosion and Conservation Management of Iron Shipwrecks in Chuuk Lagoon. *Conservation and Management of Archaeological Sites* 7:203-223.
2012 The Mechanism and Kinetics of In Situ Conservation of Iron Cannon on Shipwreck Sites. *The International Journal of Nautical Archaeology* 42(2):382-391.
- Madsen, H. B.
1967 A Preliminary Note on the Use of Benzotriazole for Stabilizing Bronze Objects. *Studies in Conservation* 12(4):163-167.
- Madsen, Helge Brinch
1994 *Handbook of Field Conservation*. Konservatorskolen Det Kongelige Danske Kunstakademi, Copenhagen, Denmark.
- Madsen, H. B., I. Meyer, and T.B. Jakobsen
2001 Conservation of waterlogged wood: an obsolete method. In *Past Practice – Future Prospects, British Museum Occasional Paper 145*, Andrew Oddy, and Sandra Smith, editors, pp. 33-38. British Museum, London, UK.
- Mahon, Robin, Patrick McConney, and Rathindra N. Roy
2008 Governing Fisheries as Complex Adaptive Systems. *Marine Policy* 32:104-112.
- Mallinson, David J., Stephen J. Culver, Stanley R. Riggs, J.P. Walsh, Dorothea Ames, and Curtis W. Smith
2008 Past, Present and Future Inlets of the Outer Banks Barrier Islands, North Carolina. White Paper, Department of Geological Sciences, East Carolina University, Greenville, NC.

- Manders, M.
2008 In Situ Preservation: The Preferred Option. *Museum International* 60(4):31-41.
- Mardikian, P., N.G. González, M.J. Drews, & P de Vries
2010 New Perspectives Regarding the Stabilization of Terrestrial and Marine Archaeological Iron. In *The Conservation of Archaeological Materials: Current Trends and Future Directions, British Archaeological Reports International Series 2116*, Emily Williams, and Claire Peachey, editors, pp.89-95. Archaeopress, Oxford, UK.
- Mardikian, Paul, Claudia Chemello, Christopher Waters, and Peter Hull (editors)
2011 *Metal 2010, Proceedings of the Interim Meeting of the ICOM-CC Metal Working Group*. Clemson University, Charleston, SC.
- Martin Paul, S
2008 The Mass Media as Sentinel: Why Bad News About Issues is Good News for Participation. *Political Communication* 25:180-193.
- Mason, Randall, and Erica Avrami
2002 Heritage Values and Challenges of Conservation Planning. In *Management Planning for Archaeological Sites*, Jeanne Marie Teutonico, and Gaetano Palumbo, (editors), pp.13-26. The Getty Conservation Institute, Los Angeles, CA.
- Mathieson, H., Gregory, D., Jensen, P. & Sørensen, B.
2004 Environmental Monitoring at Nydam, a Waterlogged Site with Weapon Sacrifices from the Danish Iron Age: A Comparison of Methods Used and Results from Undisturbed Conditions. *Journal of Wetland Archaeology* 4:55-74.
- McCoy, Lola Love
1938 In Carolina; Signs Lead Tourists to Storied Sites. *The New York Times* 16 January. New York, NY.
- McIlvenna, Noeleen
2006 *A Very Mutinous People - The Struggle for North Carolina, 1660-1713*. The University of North Carolina Press, Chapel Hill, NC.
- McManamon, Francis P.
1991 The Many Publics for Archaeology. *American Antiquity* 56(1):121-130.
- McManamon 2002
2002 Letter to Admiral Watkins, U.S. Commission on Ocean Policy. November 21 2002.
http://govinfo.library.unt.edu/oceancommission/publiccomment/novgencomment/mcmanamon_comment
- McNinch, J.E., and J.T.Wells
1999 Sedimentary Processes and Depositional History of a Cape-Associated Shoal, Cape Lookout, North Carolina. *Marine Geology* 158:233-252.
- McNinch, J.E. and R.Luettich
2000 Physical Processes Around a Cuspate Foreland: Implications to the Evolution and Long-Term Maintenance of a Cape-Associated Shoal. *Continental Shelf Research* 20:2367-2389.
- McNinch, Jesse E., John T. Wells, and Thomas G. Drake
2001 The Fate of Artifacts in an Energetic, Shallow-Water Environment: Scour and Burial at the Wreck Site of *Queen Anne's Revenge*. *Southeastern Geology* 40(1):19-27.
- McNinch, Jesse E., John T. Wells and Arthur C. Trembanis
2006 Predicting the Fate of Artefacts in Energetic, Shallow Marine Environments: An Approach to Site Management. *The International Journal of Nautical Archaeology* 35(2):290-309.

- McRory, Pat
2015 State of North Carolina Governor's Recommended Budget 2015-2017. North Carolina Office of State Budget and Management, March 2015. Raleigh, NC.
- 1990 Meade, Robert H., Ted R. Yuzyk, and Terry J. Day
Movement and Storage of Sediment in Rivers of the United States and Canada. *The Geology of North America Surface Water Hydrology*, Volume O-1:255-280. Geological Society of America, Boulder, CO.
- Meek, Jack W.
2010 Complexity Theory for Public Administration and Policy. *Complexity Theory for Public Administration and Policy E:CO* 12(1):1-4.
- Mertes, J., T. Thomsen, J. Gulley
2014 Evaluation of Structure from Motion Software to Create 3D Models of Late Nineteenth Century Great Lakes Shipwrecks Using Archived Diver-Acquired Video Surveys. *Journal Maritime Archaeology* 9:173-189.
- Mesnier, Charles
1717 10 décembre 1717. Arrivée d'un Bateau Commandé par le Capitaine Dosset... Martinique. Correspondances à l'arrivée. AN Col C8A 22 (1717) fo 447. In Report to North Carolina Department Cultural Resources, Archives and History, Office of State Archaeology, Raleigh, NC, from Jaques Ducoin (2001:19).
- Messier, Christian, Klaus J. Puettmann, and K. David Coates
2013 *Managing Forests as Complex Adaptive Systems: Building Resilience to the Challenge of Global Change*. Routledge, London, UK.
- Mikawi, Ali Osama Ali
2013 Sustainable Heritage: An Application of Complexity Theory to Sustainable Heritage Development. Master's thesis, University College London, Faculty of the Built Environment, Bartlett School of Graduate Studies, Centre for Sustainable Heritage.
- Milanich, Jerald
1991 Archaeology in the Sunshine: Grass Roots Education through the Media and Public. In *Protecting the Past*, George Smith and John Ehrenhard, editors, pp. 41-46. CRC Press, Boca Raton, FL.
- Miller, J. William, John E. Callahan, James R. Craig, and Katherine M. Whatley
2005 'Ruling Theories Linger': Questioning the Identity of the Beaufort Inlet Shipwreck: A Discussion. *The International Journal of Nautical Archaeology* 34(2):339-340.
- Mischen, Pamela, A., and Stephen K. Jackson
2008 Connecting the Dots: Applying Complexity Theory, Knowledge Management and Social Network Analysis to Policy Implementation. *Public Administration Quarterly* 32(3):314-338.
- Moore, David, D.
1997 Blackbeard the Pirate: Historical Background and the Beaufort Inlet Shipwrecks. *Tributaries* 7:731-35. North Carolina Maritime History Council, Beaufort, NC.
- 2005 Technical Comments Relating to 'Ruling Theory' and the Identification of the Beaufort Inlet Wreck. *The International Journal of Nautical Archaeology* 34(2):335-339.
- Moore, David M. and Mike, Daniel
2001 Blackbeard's Capture of the Nantaise Slave Ship La Concorde: A Brief Analysis of the Documentary Evidence. *Tributaries*: 11:14-31. North Carolina Maritime History Council, Beaufort, NC.

- Moore, Louise, T.
1951 Civil War Wrecks Dot Carolina Coastline. *News and Observer* 17 June 17:47. Raleigh, NC.
- Morris, Kea
1986 Field Notes from Documentation of Lake Phelps Canoes for Unfinished Master's thesis, Department Anthropology, East Carolina University. Manuscript, North Carolina Department Cultural Resources, Archives and History, Office of State Archaeology, Underwater Archaeology Branch, Kure Beach, NC.
- Morris, John, W., III
2018 The Site History of 31CR314, Queen Anne's Revenge, A Retrospective Assessment. *The North Carolina Historical Review*, XCV (2): 221-230.
- Mosher, F.C. and Others
1974 Watergate: Implications for responsible government. In *Classics of Public Administration*, 6th editions, J.M. Shafritz, and A.C. Hyde, editors, pp.323-329. Wadsworth, Boston, MA.
- Muckelroy, Keith
1977 Historic Wreck Sites in Britain and their Environments. *The International Journal of Nautical Archaeology* 6(1): 47-57.

1978 *Maritime Archaeology*. Cambridge University Press, Cambridge, UK.
- National Oceanic and Atmospheric Administration (NOAA)
2008 Monitor National Marine Sanctuary State of the Sanctuary Report. U.S. Department of Commerce, Washington, DC.

2014 Thunder Bay National Marine Sanctuary NOAA Expeditions 2014: 2G Robotics 3D Scanning Survey of Wooden Freighter *Monohansett* (1872). Accessed at: <https://thunderbay.noaa.gov/research/expeditions.html#research2014>
- National Park Service (NPS)
2007 Abandoned Shipwreck Guidelines. Accessed at <https://www.nps.gov/archeology/submerged/federal.htm>

2009 National Register Historic Places (NPS NRHP). Accessed at <http://nrhp.focus.nps.gov/natreghome.do> on December 2009 (site now discontinued).

2015 National Register Historic Places (NPS NRHP). Properties Listed on National Register of Historic Places. National Park Service online listing accessed at: <https://www.nps.gov/subjects/nationalregister/index.htm>.
- News and Observer
1912 The Neuse Makes Record Low Mark. *The News and Observer* 14 August:6. Raleigh, NC.
- New York Times*
1864 The Rebel Rams in the Neuse and Roanoke. *The New York Times* 7 March:8. New York, NY.
- North, N.A.
1976 Formation of Coral Concretions on Marine Iron. *The International Journal of Nautical Archaeology and Underwater Exploration* 5(3):253-258.
- North Carolina Constitution
Accessed 2018 at <https://www.ncleg.gov/Laws/Constitution>.
- North Carolina State Government (NC)
1903 An Act to Establish an Historical Commission. North Carolina General Statute, Chapter 767. North Carolina General Assembly, Raleigh, NC.

- 1907 An Act to Amend Chapter 96 of the Revisal of 1905 Relating to the State Historical Commission. North Carolina General Statute, Chapter 714.
- 1927 State of North Carolina, The Budget, 1927-1929. North Carolina General Assembly, Raleigh, NC.
- 1928 State of North Carolina, The Budget, 1929-1931. North Carolina General Assembly, Raleigh, NC.
- 1930 State of North Carolina, The Budget, 1931-1933. North Carolina General Assembly, Raleigh, NC.
- 1935a Public Records Law. North Carolina General Statute, Chapter 265. North Carolina General Assembly, Raleigh, NC.
- 1935b North Carolina Highway Historical Marker Program Act. North Carolina General Statute, Chapter 197. North Carolina General Assembly, Raleigh, NC.
- 1935c Indian Antiquities Act. North Carolina General Statute, Chapter 70 Article 1. North Carolina General Assembly, Raleigh, NC.
- 1936 State of North Carolina, The Budget, 1937-1939. North Carolina General Assembly, Raleigh, NC.
- 1945 Archives and History Act. North Carolina General Statute, Chapter 121. North Carolina General Assembly, Raleigh, NC.
- 1950 State of North Carolina, The Budget, 1951-1953. North Carolina General Assembly, Raleigh, NC.
- 1955 Archives and History Act. North Carolina General Statute, Chapter 121. North Carolina General Assembly, Raleigh, NC.
- 1961 An Act to Appropriate Funds to the North Carolina Confederate Centennial Commission. North Carolina General Assembly, 1961 Session, Chapter 1064, Senate Bill 171. North Carolina General Assembly, Raleigh, NC.
- 1963a An Act to Appropriate Funds to Preserve and Restore Historical Artifacts. North Carolina General Assembly, 1963 Session, Chapter 1040, Senate Bill 169. North Carolina General Assembly, Raleigh, NC.
- 1963b An Act to Appropriate Funds to the State Department of Archives and History for a Museum-Visitor Center at Fort Fisher, New Hanover County. North Carolina General Assembly, 1963 Session, Chapter 1042, Senate Bill 232. North Carolina General Assembly, Raleigh, NC.
- 1965 State of North Carolina, The Budget, 1965-1967. North Carolina General Assembly, Raleigh, NC.
- 1967 An Act to Establish Ownership of All Bottoms in Certain Waters and to Establish Procedures for Conducting Salvage of Abandoned Shipwrecks and Other Underwater Archaeological Sites. North Carolina General Assembly, 1967 Session, Chapter 533. Articles 1, 2, 3. North Carolina General Assembly, Raleigh, NC.
- 1969 State of North Carolina, The Budget, 1969-1971. North Carolina General Assembly, Raleigh, NC.
- 1971a Protection and Enhancement of Historical and Cultural Heritage of North Carolina. North Carolina Executive Order, XVI. North Carolina General Assembly, Raleigh, NC.
- 1971b Reorganization of State Government. North Carolina Executive Order. North Carolina General Assembly, Raleigh, NC.
- 1971c North Carolina Environmental Policy Act. North Carolina General Statute, Chapter 113A. North Carolina General Assembly, Raleigh, NC.

- 1971d Open Meetings Law. North Carolina General Statute, Chapter 143. North Carolina General Assembly, Raleigh, NC.
- 1972 Act to Establish Department of Art, Culture and History: Office of Archives and History. North Carolina General Statute, Chapter 121. Article 1. North Carolina General Assembly, Raleigh, NC.
- 1973a Salvage of Abandoned Shipwreck and other Underwater Archaeological Sites. North Carolina General Statutes Chapter 121, Article 3. North Carolina Session Laws, Salvage of Abandoned Shipwrecks and Other Underwater Archaeological Sites, (1967, c. 533; 1973, North Carolina Archives and History Act, Chapter 121, Article 3). North Carolina General Assembly, Raleigh, NC.
- 1973b Archives and History Act – Amendments - established Department of Cultural Resources, Division of Archives and History. North Carolina General Statute Chapter 121, Article 1. North Carolina General Assembly, Raleigh, NC.
- 1973c Coastal Area Management Act (CAMA). North Carolina General Statute Chapter 113, Conservation and Development Article 7. North Carolina General Assembly, Raleigh, NC.
- 1981a Archaeological Resources Protection Act. North Carolina General Statute 70, Article 2. North Carolina General Assembly, Raleigh, NC.
- 1981b Unmarked Human Burial and Human Skeletal Remains Protection Act. North Carolina General Statute 70, Article 3. North Carolina General Assembly, Raleigh, NC.
- 1984 Administrative Code Cultural Resources – Archives and History – Exploration: Recovery: Salvage.T07:04R.1000. North Carolina General Assembly, Raleigh, NC.
- 2007 An Act to Appropriate Funds for the Preservation of the CSS Neuse, A Civil War-Era Ironclad Gunboat. North Carolina, General Assembly Session 2007. North Carolina General Assembly, Raleigh, NC.
- 2013 State of North Carolina, The Budget, 2013-2015. North Carolina General Assembly, Raleigh, NC.
- 2015 North Carolina Archives and History Act Amendment (1945, c. 55; 1955, c. 543, s. 1; 1973, c. 476, s. 48; 2015-241, s. 14.30(s).) North Carolina, Chapter 121, Article 3. North Carolina General Assembly, Raleigh, NC.
- North Carolina Department/Division/Office of Archives and History (NC A&H)
- 1956 *Twenty-Sixth Biennial Report of the North Carolina Department of Archives and History 1954-1956*. State Library North Carolina, Raleigh, NC.
- 1958 *Twenty-Seventh Biennial Report of the North Carolina Department of Archives and History 1956-1958*. State Library North Carolina, Raleigh, NC.
- 1960 *Twenty-Eighth Biennial Report of the North Carolina Department of Archives and History 1958-1960*. State Library North Carolina, Raleigh, NC.
- 1962 *Twenty-Ninth Biennial Report of the North Carolina Department of Archives and History 1960-1962*. State Library North Carolina, Raleigh, NC.
- 1964 *Thirtieth Biennial Report of the North Carolina Department of Archives and History 1962-1964*. State Library North Carolina, Raleigh, NC.
- 1966 *Thirty-First Biennial Report of the North Carolina Department of Archives and History 1964-1966*. State Library North Carolina, Raleigh, NC.

- 1968 *Thirty-Second Biennial Report of the North Carolina Department of Archives and History 1966-1968.* State Library North Carolina, Raleigh, NC.
- 1970 *Thirty-Third Biennial Report of the North Carolina Department of Archives and History 1968-1970.* State Library North Carolina, Raleigh, NC.
- 1974 *Thirty-Fifth Biennial Report of the North Carolina Department of Archives and History 1972-1974.* State Library North Carolina, Raleigh, NC.
- 1976 *Thirty-Sixth Biennial Report of the North Carolina Division of Archives and History 1974-1976.* State Library North Carolina, Raleigh, NC.
- 1979 *Thirty-Seventh Biennial Report of the North Carolina Department of Archives and History 1976-1978.* State Library North Carolina, Raleigh, NC.
- 1981 *Thirty-Eighth Biennial Report of the North Carolina Department of Archives and History 1978-1980.* State Library North Carolina, Raleigh, NC.
- 1983 *Thirty-Ninth Biennial Report of the North Carolina Department of Archives and History 1980-1982.* State Library North Carolina, Raleigh, NC.
- 1985 *Fortieth Biennial Report of the North Carolina Department of Archives and History 1982-1984.* State Library North Carolina, Raleigh, NC.
- 1987 *Forty-First Biennial Report of the North Carolina Division of Archives and History 1984-1986.* State Library North Carolina, Raleigh, NC.
- 1991 *Forty-Third Biennial Report of the North Carolina Division of Archives and History 1988-1990.* State Library North Carolina, Raleigh, NC.
- 1993 *Forty-Fourth Biennial Report of the North Carolina Division of Archives and History 1990-1992.* State Library North Carolina, Raleigh, NC.
- 1995 *Forty-Fifth Biennial Report of the North Carolina Division of Archives and History 1992-1994.* State Library North Carolina, Raleigh, NC.
- 1997 *Forty-Sixth Biennial Report of the North Carolina Division of Archives and History 1994-1996.* State Library North Carolina, Raleigh, NC.
- 1999 *Forty-Seventh Biennial Report of the North Carolina Division of Archives and History 1996-1998.* State Library North Carolina, Raleigh, NC.
- 2001 *Forty-Eighth Biennial Report of the North Carolina Division of Archives and History 1998-2000.* State Library North Carolina, Raleigh, NC.
- 2003 *Forty-Ninth Biennial Report of the North Carolina Office of Archives and History 2000-2002.* State Library North Carolina, Raleigh, NC.
- 2005 *Fiftieth Biennial Report of the North Carolina Office of Archives and History 2002-2004.* State Library North Carolina, Raleigh, NC.
- 2007 *Fifty-First Biennial Report of the North Carolina Office of Archives and History 2004-2006.* State Library North Carolina, Raleigh, NC.
- 2009 *Fifty-Second Biennial Report of the North Carolina Office of Archives and History 2006-2008.* State Library North Carolina, Raleigh, NC.

- 2011 *Fiftieth-Third Report of the North Carolina Office of Archives and History 2008-2010*. State Library North Carolina, Raleigh, NC.
- 2013 *Fifty-Fourth Biennial Report of the North Carolina Division of Archives and History 2010-2012*. State Library North Carolina, Raleigh, NC.
- 2015 *Fifty-Fifth Biennial Report of the North Carolina Office of Archives and History 2012-2014*. State Library North Carolina, Raleigh, NC.
- 2017 *Fifty-Sixth Biennial Report of the North Carolina Office of Archives and History 2014-2016*. State Library North Carolina, Raleigh, NC.

North Carolina Department of Natural and Cultural Resources, Office of Archives and History, Division of Historic Resources, Office of State Archaeology, Queen Anne's Revenge Conservation Lab (NC A&H/OSA/QAR Lab)

- 2009 QAR Lab Monthly Activity Report November 2009. Manuscript, North Carolina Department Natural and Cultural Resources, Archives and History, Office State Archaeology, QAR Lab, Greenville, NC.
- 2011 QAR Lab Monthly Activity Report July 2011. Manuscript, North Carolina Department Natural and Cultural Resources, Archives and History, Office State Archaeology, QAR Lab, Greenville, NC.

North Carolina Department of Cultural Resources, Archives and History, Office of State Archaeology, Underwater Archaeology Branch (NC A&H/OSA/UAB)

- 2011 Underwater Sites Database. North Carolina Department Natural and Cultural Resources, Archives and History, Office State Archaeology, Underwater Archaeology Branch, Kure Beach, NC. Copy in Excel provided to author 2011.
- 2016 *Bibliography of North Carolina Underwater Archaeology*. Compiled by Barbara Lynn Brooks, Ann M. Merriman, and Madeline P. Spencer (2009). Updated by Madeline P. Spencer. Manuscript, North Carolina Department Natural and Cultural Resources, Archives and History, Office State Archaeology, Underwater Archaeology Branch, Kure Beach, NC. Copy in Excel provided to author 2016.

North Carolina Department of Environment, Health and Natural Resources (NC DEHNR)

- 1994 *General Management Plan for Pettigrew State Park*. Report by Division of Parks and Recreation, Planning and Development Section.

North Carolina Division of Tourism, Film and Sports Development (NC DTFSD)

- 2011 *2010 North Carolina Visitor Profile*. North Carolina Department of Commerce, Raleigh, NC.
- 2012 *2011 North Carolina Visitor Profile*. North Carolina Department of Commerce, Raleigh, NC.
- 2013 *2012 North Carolina Visitor Profile*. North Carolina Department of Commerce, Raleigh, NC.
- 2014 *2013 North Carolina Visitor Profile*. North Carolina Department of Commerce, Raleigh, NC.

North Carolina Historical Commission (NC HC)

- 1904 *Report of the Historical Commission to Governor Charles B. Aycock, 1903-1905*. State Library North Carolina, Raleigh, NC.
- 1907 *Report of the Historical Commission to Governor Charles B. Aycock 1905-1907*. State Library North Carolina, Raleigh, NC.
- 1912 *Fourth Biennial Report of the North Carolina Historical Commission, 1910-1912*. State Library North Carolina, Raleigh, NC.
- 1930 *Thirteenth Biennial Report of the North Carolina Historical Commission, 1928-1930*. State Library North Carolina, Raleigh, NC.

North Carolina Highway Historic Marker Program (NC HHM)

2011 NC Highway Historic Marker Program. At <http://www.ncmarkers.com/search.aspx> Accessed April 2011.

2017 NC Highway Historic Marker Program. At <http://www.ncmarkers.com/search.aspx> Accessed 2017.

North Carolina Department of Natural and Cultural Resources (NC NCR)

2016 *North Carolina Department Natural and Cultural Resources Strategic Plan 2016-2018*. North Carolina Department Natural and Cultural Resources, Raleigh, NC.

2019 *North Carolina Department Natural and Cultural Resources Strategic Plan 2019-2021*. North Carolina Department Natural and Cultural Resources, Raleigh, NC.

North Carolina Department of Natural and Cultural Resources, National Register Historic Places (NC NRHP)

2015 The National Register of Historic Places in North Carolina: Facts and Figures. Fact Sheet 4. North Carolina Department Natural and Cultural Resources, Office of Archives and History, State Historic Preservation, Office, Raleigh, NC.

2016 North Carolina Listings in the National Register of Historic Places as of 10/22/2016. North Carolina State Historic Preservation Office. Accessed November 2016 at <http://www.hpo.ncdcr.gov>. [March 2018 at: <https://www.ncdcr.gov/state-historic-preservation-office>].

2018a What is the National Register of Historic Places? National Register Fact Sheet 1. North Carolina Department Natural and Cultural Resources, Office of Archives and History, State Historic Preservation, Office, Raleigh, NC.

2018b How Historic Properties are Listed on the National Register Historic Places. National Register Fact Sheet 3. North Carolina Department Natural and Cultural Resources, Office of Archives and History, State Historic Preservation, Office, Raleigh, NC.

North Carolina Office of State Budget and Management (NC OSBM)

2013 Certified Budget: Department of Cultural Resources, Biennium 2013-2015. Code: 14800. Form BD 307 8/13. North Carolina Office of State Budget and Management, Raleigh, NC.

2013 Current Operations: Appropriation – Certified Budget for Biennium 2013-2015, S.L.2013-360 and S.L.2013-363. Form BD 307 pp.14-16.

2015 Certified Budget: Department of Natural and Cultural Resources, Biennium 2015-2017. Code: 14800. Form BD 307 pp.1-5. North Carolina Office of State Budget and Management, Raleigh, NC.

2015 Current Operations: Appropriation – Certified Budget for Biennium 2015-2017, S.L.2015-241, and S.L.2015-268. Form BD 307. pp.1-5.

2016 Current Operations: Appropriation – Certified Budget for Biennium 2015-2017 Adjustment, S.L.2016-94, and S.L.2016-123, Form BD 307(R) pp. 3-5.

North Carolina General Assembly Program Evaluation Division (NC PED)

2012 Operational Changes for State Attractions Could Yield \$1.9 million Annually and Reduce Reliance on the State. Report to the Joint Legislative Program Evaluation Oversight Committee from NC Program Evaluation Division, Report Number 2012-01. February 14, 2012. North Carolina General Assembly, Raleigh, NC.

North Carolina Department of Natural and Cultural Resources, Division of Parks and Recreation, Coastal Region (NCR/PR)

2017 *Pettigrew State Park General Management Plan*. North Carolina Department Natural and Cultural Resources, Raleigh, NC.

- North Carolina: Visit North Carolina (NC VP)
 2015 *2015 North Carolina Visitor Profile*. Visit North Carolina, A Unit of the Economic Development Partnership of North Carolina. Visit North Carolina, Raleigh, NC.
- Nixon, Taryn J.P. (editor)
 2004 *Preserving Archaeological Remains in Situ? Proceedings of the 2nd Conference 12-14th September 2001*. Museum of London Archaeology Service, London, UK.
- O’Cain, Fletcher, Anthony Kennedy, Sarah Watkins-Kenney, and John Kenney
 2012 Quantitative Evidence of Sugar Hydrolysis in Wood Artifacts. In *Proceedings of the 11th ICOM-CC Group on Wet Organic and Archaeological Materials Conference: Greenville 2010*, Kristian Straetkvern, and Emily Williams, editors, pp.355-358, ICOM-CC WOAM, Durham, UK.
- Olsen, J.P.
 2008 The Ups and Downs of Bureaucratic Organization. *Annual Review of Political Science* 11:13-37.
- Orduna-Malea, Enrique, Juan M Ayllón, Alberto Martín-Martín, and Emilio Delgado López- Cózar.
 2015 Methods for Estimating the Size of Google Scholar. *Scientometrics* 104(3):931–949.
- Palma, P.
 2005 Monitoring of shipwreck sites. *The International Journal of Nautical Archaeology* 34(2):323-331.
- The Philadelphia Inquirer*
 1955 Skin-Divers Explore Confederate Hulks. *The Philadelphia Inquirer* 13 November: 41. Philadelphia, PA.
- Parrent, James M.
 1985 The Conservation of Waterlogged Wood Using Sucrose. *Studies in Conservation* 30:63–72.
- Parrott Lael and Holger Lange
 2013 An Introduction to Complexity Science. In *Managing Forests as Complex Adaptive Systems: Building Resilience to the Challenge of Global Change*, Christian Messier, Klaus J. Puettmann, and K. David Coates, editors, pp. 18-32. Routledge, London, UK.
- Pearson, C. (editor)
 1987 *Conservation of Marine Archaeological Objects*. Butterworths, London, UK.
- Phelps, David Sutton
 1989 *Ancient Pots and Dugout Canoes, Indian Life as Revealed by Archaeology at Lake Phelps*. Brochure for North Carolina Pettigrew State Park 2002. Department of Anthropology, East Carolina University, Greenville, NC.
- Pierce, Greg
 2010 A Synthesis of the Prehistoric Archaeological Investigations of Lake Phelps, Washington County, North Carolina. Master’s thesis, Department of Anthropology, East Carolina University, Greenville, NC.
- Plenderleith, H. J., and A. E. A. Werner.
 1971 *The Conservation of Antiquities and Works of Art*. Oxford University Press, Oxford, UK.
- Pletinckx, Daniel
 2011 Virtual Archaeology as an Integrated Preservation Method. *Virtual Archaeology Review* 2(4): 33-37.
- Plets, Ruth, Rory Quinn, Wes Forsythe, and Kieran Westley
 2011 Using Multi-Beam Echo-Sounder Data to Identify Shipwreck Sites: Archaeological Assessment of the Joint Irish Bathymetric Survey Data. *The International Journal of Nautical Archaeology* 40 (1): 87-98.
- Pollard, Mark, Catherine Batt, Ben Stern, and Suzanne M.M. Young
 2007 *Analytical Chemistry in Archaeology*. Cambridge University Press, Cambridge, UK.

- Poole, Marshall Scott, and Andrew H. Van de Ven
2004 *Handbook of Organizational Change and Innovation*. Oxford University Press, Oxford, UK.
- Poulios, Ioannis
2010 Moving Beyond a Values-Based Approach to Heritage Conservation. *Conservation and Management of Archaeological Sites* 12(2): 170-185.
- Powell, William S.
1989 *North Carolina through Four Centuries*. University of North Carolina Press, Chapel Hill, NC.
- Powell, William, S. (editor)
2006 *Encyclopedia of North Carolina*. University of North Carolina Press, Chapel Hill, NC.
- Powell K.L., S. Pedley, G. Daniel, and M. Corfield
2001 Ultrastructural Observations of Microbial Succession and Decay of Wood Buried at a Bronze Age Archaeological Site. *International Biodeterioration and Biodegradation* 47(3):165-173.
- Price, J
2012 Civil War Shipwreck Yields its Last Treasures - The vessel was Excavated in 1962, but Many Artifacts went into Storage Tanks. *The Charlotte Observer* 8 March: 1A. Charlotte, NC.
- Quinn, Rory,
2006 The Role of Scour in Shipwreck Formation Processes and the Preservation of Wreck-Associated Scour Signatures in the Sedimentary Record – Evidence from Seabed and Sub-Surface Data. *Journal of Archaeological Science* 33:1419-1432.
- Quinn, Rory, and Donal Boland
2010 The Role of Time-Lapse Bathymetry Surveys in Assessing Morphological Change at Shipwreck Sites. *Journal of Archaeological Science* 37: 2938-2946.
- Rainey, Hal, G.
2009 *Understanding and Managing Public Organizations*, 4th edition. Jossey-Bass, San Francisco, CA.
- Ransley, Jesse
2007 Rigorous Reasoning, Reflexive Research and the Space for ‘Alternative Archaeologies’. Questions for Maritime Archaeological Heritage Management. *The International Journal of Nautical Archaeology* 36(2):221-237.
- Rethemeyer, R.K. & D.M. Hatmaker
2007 Network Management Reconsidered: An Inquiry into Management of Network Structures in Public Sector Service Provision. *Journal Public Administration Research* 18:617-646.
- Rhodes, M.L.
2008 Complexity and Emergence in Public Management. *Public Management Review* 10(3):361-379
- Rhodes, Mary Lee, and John Murray
2007 Collaborative Decision Making in Urban Regeneration: A Complex Adaptive Systems Perspective. *International Public Management Journal* 10(1): 79-101.
- Rhodes, Mary Lee, Joanne Murphy, Jenny Muir, and John A. Murray
2011 *Public Management and Complexity Theory - Richer Decision Making in Public Services*. Routledge, New York, NY.
- Richards, Vicki
2012 In Situ Preservation and Monitoring of the James Matthews Shipwreck Site. *Conservation and Management of Archaeological Sites* 14(1-4):169-181.

- Richards, Vicki and Jennifer McKinnon (ed.)
 2009 *In Situ Conservation of Cultural Heritage: Public, Professionals and Preservations*. Past Foundation, Flinders University, Aus.
- Riggs, Stanley R., William J. Cleary, and Stephen W. Snyder
 1995 Influence of Inherited Geologic Framework on Barrier Shoreface Morphology and Dynamics. *Marine Geology* 126:213-234
- Riggs, Stanley R., and Dorothea V. Ames
 2003 *Drowning the North Carolina Coast: Sea-Level Rise and Estuarine Dynamics*. North Carolina Sea Grant, Raleigh, NC.
- Riggs, S.R., S.J. Culver, D.V. Ames, D.J. Mallinson, D.R. Corbett, and J.P. Walsh
 2008 North Carolina's Coasts in Crisis: A Vision for the Future. White Paper, North Carolina Coastal Geology Cooperative Research Program, Department Geological Sciences and Institute for Coastal Science and Policy, East Carolina University, Greenville, NC.
- Riggs, Stanley, R., Dorothea V. Ames, Stephen J. Culver, and David J. Mallinson
 2011 *The Battle for North Carolina's Coast*. University of North Carolina Press, Chapel Hill, NC.
- Riley, W.H.
 1947 *Hydrologic Data on the Neuse River Basin 1866-1945*. North Carolina Department of Conservation and Development, USGS and US Weather Bureau. Raleigh, NC.
- Roberts, Owain T.P.
 2004 Llong Casnewydd: the Newport Ship – A Personal View. *The International Journal of Nautical Archaeology* 33(1):158-163.
- Robles, Lucía Gómez
 2010 A Methodological Approach Towards Conservation. *Conservation and Management of Sites* 12(2):146-169.
- Rodgers, Bradley A., Nathan Richards, and Wayne R. Lusardi
 2005 Ruling Theories Linger: Questioning the Identity of the Beaufort Inlet Shipwreck. *The International Journal of Nautical Archaeology* 34(1):24-37.
- Roman, C., G. Inglis, and J. Rutter
 2010 Application of Structured Light Imaging for High Resolution Mapping of Underwater Archaeological Sites. Oceans 2010 IEEE Sydney, pp.1-9, May 24-27. <http://dx.doi.org/10.1109/OCEANSSYD.2010.5603672>
- Room, Graham
 2011 *Complexity, Institutions and Public Policy, Agile Decision-Making in a Turbulent World*. Edward Elgar, Cheltenham, UK.
- Rosenhead, Jonathan
 1998 Complexity theory and management practice. Operational Research Working Papers, LSEOR 98.25. Department of Operational Research, London School of Economics and Political Science, London, UK.
- Rosenqvist, Anna M.
 1959 The Stabilizing of Wood Found in the Viking Ship of Oseberg: Part I. *Studies in Conservation* 4(1):13-22.
- Runyan, Timothy
 2011 Management of Maritime Cultural Resources: An American Perspective. In *Oxford Handbook of Maritime Archaeology*, Alexis Catsambis, Ben Ford, and Donny L. Hamilton, editors, pp.942-966. Oxford University Press, Oxford, UK.

- Ruppé, Carol, V., and Janet F. Barstad (editors)
2002 *An International Handbook of Underwater Archaeology*. Kluwer Plenum, College Station, TX.
- Sasser, Janna, and Katie Mosher
2016 *Matthew's Legacy: Water Falling and Rising*. *CoastWatch* 2016-2. NC Sea-Grant, North Carolina State University, Raleigh, NC.
- Savidge, Dana K., Jay A. Austin, and Brian O. Blanton
2013 Variation in the Hatteras Front Density and Velocity Structure: Part 2: Historical Setting. *Continental Shelf Research* 54:106-116.
- Schoenbaum, Thomas J.
1982 *Islands, Capes, and Sounds The North Carolina Coast*. John F. Blair, Winston-Salem, NC.
- Selwyn, Lyndsie
2004 *Metals and Corrosion: A Handbook for the Conservation Professional*. Canadian Conservation Institute, Ottawa, Canada.
- Shafritz, J.M., and A.C. Hyde (editors)
2008 *Classics of Public Administration*, 6th edition. Wadsworth, Boston, MA.
- Shaw, Tammy L.
2001 *Up from the Depths: The Changing Face of Maritime Salvage and Shipwreck*. Proceedings of the 12th Biennial Coastal Zone Conference, Cleveland Ohio, July 2001.
- Shih, Peter Tian-Yuan, Ya-Hsing Chen, and Jie-Chung Chen
2014 Historic Shipwreck Study in Dongsha Atoll with Bathymetric LiDAR. *Archaeological Prospection* 21:139-146.
- Shomette, Donald G.
1993 A Sub-Surface Radar Exploration of Lake Phelps, North Carolina, September 1992. Report to North Carolina Department Cultural Resources, Archives and History, Office State Archaeology, Underwater Archaeology Branch (Kure Beach, NC) from Nautical Archaeological Associates, Upper Marlboro, MD.
- Simpson, Marcus B., and Sallie W. Simpson
1990 *Whaling on the North Carolina Coast*. North Carolina Department of Cultural Resources, Raleigh, NC.
- Smith, Jodi Jones, Robert Dolan, and Harry Lins
2006 Hurricane History of the North Carolina Outer Banks (U.S.A), 1584 to 2004. *Shore and Beach* 74(3):19-23.
- Smith, J.
2012 Virtually Recreating the Past. *American Archaeology* 16(4):13-18.
- Smith III, J.
2015 CSS *Neuse* Interpretive Center officially opens Saturday. *The Free Press* 8 March. Kinston, NC.
- Smith, C. Wayne
2003 *Archaeological Conservation Using Polymers: Practical Applications for Organic Artifact Stabilization*. Texas A&M University Press, College Station, TX.
- South Carolina Court of Vice-Admiralty
1719 *The Tryals of Major Stede Bonnet and Other Pirates*. Benjamin Cowse, London, England.
- Southerly, Chris
2012 Grants, Donations, and In-Kind Support Received by NC Underwater Archaeology Branch. *Worth Saving Newsletter of the North Carolina Historic Preservation Office*, August 2012, 10:3-4.

- Spirek, James, D., and Della A. Scott-Ireton (editors)
 2003 *Submerged Cultural Resource Management: Preserving and Interpreting Our Sunken Maritime Heritage*. Kluwer Academic/Plenum, New York, NY.
- Stacey, Ralph, D.
 2010 *Complexity and Organizational Reality – Uncertainty and the Need to Rethink Management After the Collapse of Investment Capitalism*. Routledge, Abingdon, UK.
- Stacey, Ralph, D., Douglas Griffin, and Patricia Shaw
 2000 *Complexity and Management Fad or Radical Challenge to Systems Thinking?* Routledge, London, UK.
- Stahle, D.W., M.K. Cleveland, M.K., and J.G. Hehr
 1988 North Carolina Climate Changes Reconstructed from Tree Rings: AD372 to 1985. *Science New Series* 240(4858): 1517-1519.
- Steelman, B.
 2012a Civil War wreck to get anniversary attention. *Star News* 31 January. Wilmington, NC.
 2012b 150 years later, sunken ship still fascinates. *Star News* 22 June. Wilmington, NC.
- Stephens, Larry J.
 2004 *Advanced Statistics De-Mystified A Self-Teaching Guide*. McGraw Hill, New York, NY.
- Stewart, Kevin G., and Mary-Russell Roberson,
 2007 *Exploring the Geology of the Carolinas*. University of Chapel Hill Press, Chapel Hill, NC.
- Stick, David
 1952 *Graveyard of the Atlantic Shipwrecks of the North Carolina Coast*. University of North Carolina Press, Chapel Hill, NC.
 2006 Counties. In *Encyclopedia of North Carolina*, William S. Powell, editor, pp.297-300. University of North Carolina Press, Chapel Hill, NC.
- Stillman, R.J.
 2010 The Study of Public Administration in the United States: The Eminently Practical Science. In *Public Administration, Concepts and Cases*, R.J. Stillman, editor, pp.17-30. Wadsworth, Boston, MA.
- Stills, William, N., and Richard A. Stephenson
 2019 *Shipbuilding in North Carolina 1688-1918*. North Carolina Office of Archives and History, Raleigh, NC.
- Straetkvern, Kristian, and Emily Williams (editors)
 2012 *Proceedings of the 11th ICOM-CC Group on Wet Organic and Archaeological Materials Conference: Greenville 2010*. ICOM-CC WOAM, Durham, UK.
- Surface International Diving Company (SIDCO)
 2002 The 2002 Core Banks Beach Wreck Survey. A Field Survey Conducted by SIDCO in Support of the NC UAB Beach Wreck Program. Report from SIDCO to North Carolina Department Cultural Resources, Archives and History, Office of State Archaeology, Underwater Archaeology Branch. Kure Beach, NC.
- Taylor, F.W.
 1911 Scientific management. In *Classics of Public Administration*, 6th edition, J.M. Shafritz, and A.C. Hyde, editors, pp.36-38. Wadsworth, Boston, MA.
- Teisman, Geert R., and Erik-Hans Klijn
 2008 Complexity Theory and Public Management. An Introduction. *Public Management Review* 10(3):287-297.

Tise, Larry E.

1978 Statement of Purpose – The Monitor: Its Meaning. In *The Monitor Its Meaning and Future: Papers from a National Conference, April 2-4 1978*, pp.13-17. The Preservation Press, National Trust for Historic Preservation, Washington, DC.

Torre, Marta de la, (editor)

2005 *Heritage Values in Site Management Four Case Studies*. The Getty Conservation Institute, Los Angeles, CA.

Townsend, Samuel P.

1963a Preservation at Fort Fisher. *Tarheel Historian* 11(3).

1965a Progress in Underwater Archaeology in North Carolina. Paper presented at the 2nd Conference on Underwater Archaeology, Royal Ontario Museum, Toronto, Canada.

1965b Raising the Confederate Ironclad Ram “Neuse”. Progress in Underwater Archaeology in North Carolina. Presented to Second Conference on Underwater Archaeology, Royal Ontario Museum, Toronto, Canada.

1972 Diving on Sunken Blockade-Runners, Underwater Archaeology off the Coast of Fort Fisher. *Tar Heel Junior Historian* 2(4):15-16.

Truscott, Marilyn, and David Young

2000 Revising the Burra Charter: Australia ICOMOS Updates its Guidelines on Conservation Practice. *Conservation and Management of Archaeological Sites* 2:101-116.

Underwater Archaeological Associates (UAA)

1971 Report for Quarter Ending September 30, 1971- *Modern Greece*. Report to North Carolina Department Cultural Resources, Archives and History, Office State Archaeology, Underwater Archaeology Branch (Kure Beach, NC) from Underwater Archaeological Associates, NC.

UNESCO

2001 *Convention for the Protection of Underwater Cultural Heritage*. UNESCO, Paris, France.

2013 *Underwater Cultural Heritage*

<http://www.unesco.org/new/en/culture/themes/underwater-cultural-heritage/the-underwater-heritage/wrecks/> Accessed 6 August 2013.

U.S. Census Bureau (US Census)

1900 *Census 1900 North Carolina Population and Housing Unit Counts*, pp.494. U.S. Department of Commerce, U.S. Census Bureau. Washington D.C.

1950 *Census 1950: North Carolina Population and Housing Unit Counts 1790-1950*. 33-7, 33:35-37. U.S. Department of Commerce, U.S. Census Bureau. Washington D.C.

1960 *Census 1960: North Carolina Population and Housing Unit Counts*. CPH-2-35. U.S. Department of Commerce, U.S. Census Bureau. Washington D.C.

1970 *Census 1970: North Carolina Population and Housing Unit Counts*. CPH-2-35. U.S. Department of Commerce, U.S. Census Bureau. Washington D.C.

1980 *Census 1980: North Carolina Population and Housing Unit Counts*. CPH-2-35. U.S. Department of Commerce, U.S. Census Bureau. Washington D.C.

1990 *Census 1990: North Carolina Population and Housing Unit Counts*. CPH-2-35. U.S. Department of Commerce, U.S. Census Bureau. Washington D.C.

- 2000 *Census 2000: North Carolina Population and Housing Unit Counts. CPH-2-35.* U.S. Department of Commerce, U.S. Census Bureau. Washington D.C.
- 2012 *Census 2010: North Carolina Population and Housing Unit Counts. CPH-2-35.* U.S. Department of Commerce, U.S. Census Bureau. Washington D.C.
- Varmer, Ole
- 2014 *Underwater Cultural Heritage Law Study.* OCS Study BOEM 2014-005. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Headquarters, Herndon, VA.
- Vidal, Ludovic-Alexandre, and Franck Marle
- 2008 Understanding Project Complexity: Implications on Project Management. *Kybernetes* 37(8):1094-1110.
- Waddell, P.J.A.
- 2007 Timber Reburial. In *The Underwater Archaeology of Red Bay*, R. Grenier, M. Bernier, and W. Stevens (editors), pp.149-153. Parks Canada, Ottawa, Canada.
- Walton, Mat
- 2014 Applying Complexity Theory: A Review to Inform Evaluation Design. *Evaluation and Program Planning* 45:119-126.
- Ward, Trawick H., and R.P. Stephen Davis
- 1999 *Time Before History, the Archaeology of North Carolina.* UNC Press, Raleigh, NC.
- Ward, I.A.K., P. Larcombe, and P. Veth
- 1999a A New Process-Based Model for Wreck Site Formation. *Journal of Archaeological Science* 26:561-570.
- Ward, I.A.K., P. Larcombe, R. Brinkman, R.M.Carter.
- 1999b Sedimentary Processes and the Pandora Wreck, Great Barrier Reef, Australia. *Journal of Field Archaeology* 26(1):41-53.
- Watkins-Kenney, Sarah
- 2008 Conservation Report and Recommendations for Lake Phelps Dugout Log Canoes. Report for North NCDCCR Underwater Archaeology Branch. Manuscript, North Carolina Department Cultural Resources, Archives and History, Office State Archaeology, Underwater Archaeology Branch, Kure Beach, NC.
- 2010a Conservation Provision for Beaufort Inlet Shipwreck 31CR314 Queen Anne's Revenge Shipwreck Project: 1996-2009. Queen Anne's Revenge Shipwreck Project Research Report and Bulletin Series, QAR-R-10-01. North Carolina Department of Cultural Resources, Archives and History, Office State Archaeology, Raleigh, NC.
- 2010b Getting the Job Done: Challenges Presented by Continuity, Change, and Controversy in the Conservation of Artifacts in Shipwreck Archaeology. In, *The Conservation of Archaeological Materials Current Trends and Future Directions*, BAR International Series 2116, Emily Williams and Claire Peachey, editors, pp. 47-56. Archaeopress, Oxford, UK.
- 2010c Crisis at Corolla: Rescue of a Colonial Era Shipwreck: A Case Study in Crisis Management. Manuscript, Department Public Administration, East Carolina University, Greenville, NC.
- 2014 Conservation of Waterlogged Finds. In *Encyclopedia of Global Archaeology*, Claire Smith, editor, Springer, New York, NY. DOI: https://doi.org/10.1007/978-1-4419-0465-2_583
- 2018 A Tale of One Ship with Two Names: Discovering the Many Hidden Histories of *La Concorde* and *Queen Anne's Revenge*. *The North Carolina Historical Review*, Volume XCV (2):6-19.

- Watkins-Kenney, Sarah C., Eric Nordgren, Wendy M. Welsh and Nathan C. Henry
 2004 The Queen Anne's Revenge Shipwreck Project: Recovery, Examination and Treatment of wood. In *Proceedings of the 9th ICOM Group on Wet Organic Archaeological Materials (WOAM) Conference*, P. Hoffman, K. Straetkvern, and J. Spriggs, editors, pp. 389-402. ICOM-CC WOAM, Paris, France.
- Watkins-Kenney, Sarah, Daniel Bera, Shanna Daniel, Kimberly Kenyon, John Morris, Chris Southerly, Katrina Twing, Wendy Welsh, and Mark Wilde-Ramsing
 2015 Developing a Corrosion Model for Queen Anne's Revenge (QAR) Shipwreck Site (31CR314) to Enhance the Management of Submerged Archaeological Remains, Final Report. North Carolina Sea Grant No. R/MG-1207. North Carolina Sea Grant, University North Carolina, Raleigh, NC.
- Watkinson, David, E. and Mark Lewis
 2005 Desiccated storage of chloride-contaminated archaeological iron objects. *Studies in Conservation* 50:241-252.
- Watkinson, David, Matthew Tanner, Robert Turner, and Mark Lewis
 2005 SS Great Britain: Teamwork as a Platform for Innovative Conservation. *The Conservator* 29:73-86.
- Watkinson, David E., Melanie B. Rimmer, and Nicola J. Emmerson
 2019 The Influence of Relative Humidity and Intrinsic Chloride on Post-excavation Corrosion Rates of Archaeological Wrought Iron, *Studies in Conservation*, DOI:10.1080/00393630.2018.1565006.
- Watts, Gordon P., Jr.
 1985 Deep-Water Archaeological Investigation and Site Testing in the Monitor National Marine Sanctuary. *Journal of Field Archaeology* 12(3):315-332.
- 1989 Runners of the Union Blockade. *Archaeology* 42(5):32-39.
- Watts, Gordon, P. Jr. and Leslie S. Bright
 1973 Progress in Underwater Archaeology in North Carolina 1962-1972. *The International Journal of Nautical Archaeology* 2(1):131-136.
- Watts, Gordon P., and T. Kurt Knoerl
 2007 Entering the Virtual World of Underwater Archaeology. In *Out of the Blue Public Interpretation of Maritime Cultural Resources*, John H. Jameson, and Della A. Scott-Ireton, editors, pp.223-239. Springer, New York, NY.
- Weber, M.
 1922 Characteristics of Bureaucracy. In *Classics of Public Administration*, 6th edition, M. Shafritz, and A.C. Hyde, editors, pp. 43-48). Wadsworth, Boston, MA.
- Webster, Jane
 2008 Slave Ships and Maritime Archaeology: An Overview. *International Journal of Historical Archaeology*, 12(1):6-19.
- Webster, C.L. III
 2010 *Entrepôt: Government Imports into the Confederate States*. Edinborough Press, Roseville, MN.
- Wegner, Ansley Herring
 2003 *History for All the People, One Hundred Years of Public History in North Carolina*. The University of North Carolina Press, Chapel Hill, NC.
- Wells, John, T. and Jesse E. McNinch
 2001 Reconstructing Shoal and Channel Configuration in Beaufort Inlet: 300 Years of Change at the Site of *Queen Anne's Revenge*. *Southeastern Geology* 40(1):11-18.

- Welsh, Wendy M.
 2010 A Case Study of In Situ Monitoring on an Anchor from the Queen Anne's Revenge (1718). In *Metal 2010 International Conference on Metal Conservation*, Paul Mardikian, Claudio Chemello, Christopher Watters, and Peter Hull, editors, pp.52-58. ICOM-CC and Clemson University, Charleston, SC.
- Wheeler, Elizabeth
 1987 Identification of Wood Samples from Lake Phelps Canoes: Letter from Dr. Wheeler to Steve R. Claggett, State Archaeologist, December 15, 1987. Manuscript, North Carolina Department Cultural Resources, Archives and History, Office State Archaeology, Raleigh, NC.
- Wheeler, A.J.
 2002 Environmental Controls on Shipwreck Preservation: The Irish Context. *Journal of Archaeological Science* 29:1149-1159.
- Wilde-Ramsing, Mark U.
 2006 The Pirate Ship Queen Anne's Revenge. In *X Marks the Spot: The Archaeology of Piracy*, Russell R. Skowronek, and Charles R. Ewen, editors, pp 160-195. University of Florida Press, Gainesville, FL.
- 2009a Archaeological Investigations at the Queen Anne's Revenge Shipwreck Site », Queen Anne's Revenge Shipwreck Project Research Report and Bulletin Series, QAR-R-09-03, North Carolina Department of Cultural Resources, Raleigh, Technical Report Series. Manuscript, North Carolina Department Cultural Resources, Archives and History, Office State Archaeology, Raleigh, NC.
- 2009b Steady as She Goes . . . A Test of the Gibb's Model Using the Queen Anne's Revenge Shipwreck Site. Doctoral dissertation, Coastal Resource Management, East Carolina University, Greenville, NC
- Wilde-Ramsing, Mark, U. and Michael B. Alford
 1990 North Carolina Small Craft Historical Context; An Underwater Archaeology Unit Management Plan. Manuscript, North Carolina Department of Cultural Resources, Archives and History, Office of State Archaeology, Raleigh, NC.
- Wilde-Ramsing, Mark, U. and Wilson Angley
 1985a National Register of Historic Places Nomination Cape Fear Civil War Shipwreck District. North Carolina Department Cultural Resources, Archives and History, Office of State Archaeology, Raleigh, NC.
- Wilde-Ramsing, Mark U., and Linda F. Carnes-McNaughton
 2016 Blackbeard's Queen Anne's Revenge and its French Connection. In *Pieces of Eight: More Archaeology of Piracy*, Charles R. Ewen and Russell K. Skowronek, editors, pp.15-56. University Press of Florida, Gainesville, FL.
- 2018 *Blackbeard's Sunken Prize The 300-year voyage of Queen Anne's Revenge*. University North Carolina Press, Chapel Hill, NC.
- Wilde-Ramsing, Mark U., and Charles R. Ewen
 2012 Beyond Reasonable Doubt: A Case for Queen Anne's Revenge. *Historical Archaeology* 46(2):110-133.
- Wilde-Ramsing, Mark, U., and Christopher E. Fonvielle
 2011 Proposal: Modern Greece The Iconic Civil War Steam Blockade-Runner that Launched North Carolina's Underwater Archaeology and Maritime Conservation Program. Manuscript, North Carolina Department Cultural Resources, Archives and History, Office State Archaeology, Underwater Archaeology Branch. Kure Beach, NC.

- Wilde-Ramsing, Mark, U. and Richard W. Lawrence
 2004 North Carolina Underwater Archaeology Branch Environmental Review Procedures. Manuscript, North Carolina Department Natural and Cultural Resources, Archives and History, Office of State Archaeology, Raleigh, NC.
- Wilde-Ramsing, Mark U. and Wayne Lusardi
 1999 Management Plan for North Carolina Shipwreck 31CR314, Queen Anne's Revenge. Manuscript, North Carolina Department Cultural Resources, Archives and History, Office of State Archaeology, Raleigh, NC.
- Wilde-Ramsing, Mark, and Antonio Rodriguez
 2008 Final-Report – Using the Queen Anne's Revenge Shipwreck Site as a Testing Ground for a New Method of Artifact Protection and Preservation in Shallow-Marine Environments – Sea Grant Project Number: R/MG-0620. North Carolina Sea Grant, University North Carolina, Raleigh, NC.
- Wilde-Ramsing, Mark, D.J. Bernstein, and C.W. Freeman
 2016 Shallow Water Hydrographic Surveys in Support of Archaeological Site Preservation: *Queen Anne's Revenge Wreck Site, North Carolina*. In *ACUA Underwater Archaeology Proceedings 2016*, Paul Johnston, editor, pp. 117-121. PAST Foundation, Columbus OH.
- Wilmington Morning Star*
 1965 Complaint filed by North Carolina Department of Archives and regarding Modern Greece. *Wilmington Morning Star* 23 June. Wilmington, NC.
- 1967 North Carolina Department of Archives and History cites "1783 Treaty of Peace" as ownership claim of Modern Greece. *Wilmington Morning Star* 12 January. Wilmington, NC.
- 1968 North Carolina Supreme Court upholds Superior Court decision on state ownership of Modern Greece. April 11. *Wilmington Morning Star* 11 April. Wilmington, NC.
- Wilmington Daily Journal*
 1862a A Card. *Wilmington Daily Journal* 28 June. Wilmington, NC.
 1862b Auction Sale. *Wilmington Daily Journal* 2 July. Wilmington, NC.
 1862c Quartermaster's Office. *Wilmington Daily Journal* 3 July. Wilmington, NC.
 1862d Auction Sales. *Wilmington Daily Journal* 15 July. Wilmington, NC.
 1862e Auction Sales. *Wilmington Daily Journal* 17 July. Wilmington, NC.
 1862f Per Steamer "Modern Greece". *Wilmington Daily Journal* 19 July. Wilmington, NC.
 1862g Modern Greece. *Wilmington Daily Journal* 21 July. Wilmington, NC.
 1862h Through the blockade. *Wilmington Daily Journal* 26 July. Wilmington, NC.
 1862i Closing sales of wines, liquors, &c. *Wilmington Daily Journal* 26 July. Wilmington, NC.
 1862j Auction Sales. *Wilmington Daily Journal* 31 July. Wilmington, NC.
- The Wilmington Messenger*
 1891 A Relic of the War. *The Wilmington Messenger* 31 Oct. Wilmington, NC.
 1902a No title. *The Wilmington Messenger* 8 Aug. Wilmington, NC.
 1902b No title. *The Wilmington Messenger* 9 Aug. Wilmington, NC.
 1902c No title. *The Wilmington Messenger* 20 Aug. Wilmington, NC.
- The Wilmington News*
 1937 Piers Near Forth Fisher and Kure Beach. *The Wilmington News* 10 May. Wilmington, NC.
- Williams, Emily, and Claire Peachey (editors)
 2010 *The Conservation of Archaeological Materials Current Trends and Future Directions*. BAR International Series 2116. Archaeopress, Oxford, UK.

Wilson, W.

- 1887 The Study of Administration. In *Classics of Public Administration*, 6th edition, J.M. Shafritz, and A.C. Hyde, editors, pp.16-27. Wadsworth, Boston, MA.

Wisconsin Underwater Archaeological Association

- 1991 Salvors Continue to Challenge Legality of Shipwreck Law. *Newsletter Wisconsin's Underwater Heritage September*. WI.

Wolfe, W

- 2013a CSS Neuse Center to Host Soft Opening. *The Free Press* 17 July. Kinston, NC.

- 2013b Neuse Center Up and Running. *The Free Press* 19 July. Kinston, NC.

Woolverton, Paul

- 2015a Company that Found Blackbeard's Ship has \$14 million Dispute with N.C. *Fayetteville Observer* 17 April. Fayetteville, NC.

- 2015 Fayetteville Company Sues State in Dispute About Blackbeard's Pirate Ship. *Fayetteville Observer* 1 December. Fayetteville, NC.

Workman, Stephen

- 2008 Preservation, Ownership, and Access: Key Issues for New Underwater Cultural Heritage Legislation beyond State Waters. Doctoral dissertation, Coastal Resources Management Program, East Carolina University, Greenville, NC.

Wren, Ansley, P., and Lynn A. Leonard

- 2005 Sediment Transport on the Mid-Continental Shelf in Onslow Bay, North Carolina during Hurricane Isabel. *Estuarine, Coastal and Shelf Science* 63:43-56.

Wren, Ansley, P., Jeff A. Marshall, Lynn A. Leonard, and Melody Van Der Linde

- 2008 The Effects of Hardbottom Geometry on Sediment Transport Processes on the Mid-Continental Shelf in Onslow Bay, North Carolina. *Southeastern Geology* 45(3):111-126.

Yin, Robert K.

- 2009 *Case Study Research Design and Methods*, 4th edition. Sage, Los Angeles, CA.

Young, Perry, D.

- 1962 Civil War Relics Off Carolina Coast. *New York Times* 5 August:277. New York, NY.

Zar, Jerald H.

- 1984 *Biostatistical Analysis*. Prentice-Hall, Upper Saddle-River, NJ.
Critical Values of the Spearman's Ranked Correlation Coefficient (r_s) from Zar 1984 (Table B.19) accessed by author at:
<http://webspace.ship.edu/pgmarr/geo441/tables/spearman%20ranked%20correlation%20table.pdf>

Zebrowski, John

- 2003 Ironclad Promise. *The News and Observer* 3 July: D1. Raleigh, NC.

APPENDIX A: EAST CAROLINA UNIVERSITY INSTITUTIONAL REVIEW BOARD

ECU-IRB Notification of Exempt Certification

fromString.html

12/4/13 5:59 PM



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
4N-70 Brody Medical Sciences Building · Mail Stop 682
600 Moyer Boulevard · Greenville, NC 27834
Office 252-744-2914 · Fax 252-744-2284 · www.ecu.edu/irb

Notification of Exempt Certification

From: Social/Behavioral IRB
To: [Sarah Watkins-Kenney](#)
CC:
[Hans Vogel song](#)
Date: 12/4/2013
Re: [UMCIRB 13-002358](#)
Complexity and Conservation Management of Underwater Cultural Heritage in Public Agencies

I am pleased to inform you that your research submission has been certified as exempt on 11/25/2013. This study is eligible for Exempt Certification under category # 2,4,&5.

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

The UMCIRB office will hold your exemption application for a period of five years from the date of this letter. If you wish to continue this protocol beyond this period, you will need to submit an Exemption Certification request at least 30 days before the end of the five year period.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418

Dissertation Summary for ECU-IRB (Watkins-Kenney 2013)

In coastal zones physical remains of the past surviving in underwater environments may be designated *underwater cultural heritage* (UCH). In many countries the responsibility for conserving UCH rests with managers in public agencies. The scope and complexity of conservation goes beyond technical preservation of physical remains to also understanding and preserving cultural significance and social value.

Understanding the nature of the system or context in which public policy is made and applied is crucial for effective management approaches, decisions and actions. Complexity theory and concepts of complex systems developed in the physical sciences are beginning to be applied to public management. The purpose of this study is to investigate conservation management of UCH by public agencies from a perspective provided by complexity theory. The research will document and evaluate policy and practice in North Carolina (NC) for the conservation of its UCH since the 1960s focusing on ten shipwreck sites as case studies.

The research aims to document and understand events over time and the nature of the context within which conservation management decisions were made. Factors influencing conservation decisions will be identified. Relationships between factors and conservation actions and how these changed over time will be determined using descriptive and statistical methods. For example, time series analysis of past actions and influencing factors will be used to determine the complexity of the policy systems in which decisions were made and actions taken.

Factors investigated will include levels of public, political and professional interest in a site. The numbers of articles in North Carolina newspapers will be used as an indicator of the level of public interest in a site. Time spent on a site will be an indicator of level of professional

interest. Funding from federal or state funds will be used as an indication of level of political interest in a site.

Primary sources for data will include the archives and employees of the NC Department of Cultural Resources. Secondary sources of evidence will include: federal and state legislation and legislative testimony; literature review; historic and current newspapers (on-line databases and microfiche), archives; publications and research papers, theses and dissertations relating to the cases selected. Methods for gathering data will include: literature and document review; archive, database and media searches; and unstructured interviews with State employees involved in developing and implementing conservation strategies. Findings from this study will be used to develop a conceptual framework to guide managers in making conservation decisions for UCH.

Sarah Watkins-Kenney: Conflict of Interest Summary Statements for ECU-IRB

Does the investigator or her/his immediate family have a total financial interest consisting of royalties, salaries or other payments, ownership of stocks or other interest?

This research proposes to investigate conservation management of ten shipwreck sites by public agencies - principally the North Carolina Department of Cultural Resources (NCDCCR). The investigator is also an employee of the NC Department of Cultural Resources, Underwater Archaeology Branch (UAB). Since March 2003, I have been employed as QAR Lab Director/ UAB Chief Conservator, with responsibility for overseeing conservation of artifacts recovered from the Queen Anne's Revenge (QAR) shipwreck. The QAR is one of the case studies for this research. I have been a PhD candidate in the Coastal Resources Management Program at ECU since 2008. PhD studies and research are undertaken in my own time. In order to be a full time graduate student at ECU since 2008, I have reduced my hours employed by NCDCCR from 40 hours a week to 30 hours a week – with consequent reduction in salary.

Plan for Management of Conflict of Interest (SWK 2013)

1. Awareness of a potential for conflict of interest (COI) as an employee of NCDCCR investigating, for PhD dissertation research, projects undertaken by that Department as case studies.

2. Acknowledgment of and Disclosure – through completion of ECU UMCIRB Disclosing Real or Perceived Conflict of Interest statement, and in dissertation. The research proposed is with the knowledge and agreement of my supervisors and senior management within the NC Department of Cultural Resources.

3. Monitoring and Review of my research by my PhD Advisor (Dr Charlie Ewen), members of my Dissertation Committee, Director of the Coastal Resources Management Program (Dr Hans Vogelsohn), and by ECU IRB.

4. Vigilance in seeking objectivity in gathering, analyzing, presenting and interpreting data.

Research aim is to document and understand the contexts of a public service program (conservation of underwater cultural heritage in North Carolina) in order to provide a better and improved public service. Data will be gathered from documents that are available as public record. Unstructured interviews with public employees in their official professional capacities may be undertaken to clarify documentary evidence.

5. Compliance with codes of conduct, policies and procedures for research as required by ECU and NCDCCR.

APPENDIX B: NORTH CAROLINA DEMOGRAPHY DATA

North Carolina Population 1790-2010 (US Census Data): Total Population

	Total Pop.	% Change Total	White	% White	% Change White	Black	% Black	% Change Black	Black Slave	% Black Slave	% Change Black slave	Black Free	% Black Free	% Change Black Free	American Indian	% American Indian	% change American	Asian	% Asian	Hispanic	% Hispanic	% change Hispanic
1790	393,751		288,204	73.2		105,547	26.8		100,572	25.5		4,975	1.3									
1800	478,103	21.4%	337,764	70.7	17.2%	140,339	29.3	33.0%	133,296	27.9	32.8%	7,043	1.5	41.6%								4.2
1810	555,500	16.2%	376,410	67.7	11.4%	179,090	32.3	27.6%	168,824	30.4	26.7%	10,266	1.8	45.8%								
1820	638,829	15.0%	419,200	65.6	11.4%	219,629	34.4	22.6%	205,017	32.0	21.4%	14,612	2.2	42.3%								
1830	737,987	15.5%	471,982	64.0	12.6%	266,005	36.0	21.1%	246,462	33.4	20.2%	19,543	2.6	33.7%								
1840	753,409	2.1%	484,861	64.4	2.7%	268,548	35.6	1.0%	245,817	32.6	-0.3%	22,731	3.0	16.3%								
1850	869,039	15.3%	553,028	63.6	14.1%	316,011	36.4	17.7%	288,548	33.2	17.4%	27,463	3.1	20.8%								
1860	992,622	14.2%	631,100	63.6	14.1%	361,522	36.4	14.4%	331,059	33.4	14.7%	30,463	3.1	10.9%								
1870	1,071,361	7.9%	679,711	63.5	7.7%	391,650	36.5	8.3%	0	0	-100.0%	391,650	36.5	#####								
1880	1,399,750	30.7%	867,242	62.0	27.6%	531,277	37.9	35.7%	0	0	0	531,277	37.9	35.7%								0.1
1890	1,617,947	15.6%	1,055,382	65.2	21.7%	561,018	34.7	5.6%	0	0	0	561,018	34.7	5.6%								0.1
1900	1,893,810	17.1%	1,263,603	66.7	19.7%	624,469	33.0	11.3%	0	0	0	624,469	33.0	11.3%								0.3
1910	2,206,287	16.5%	1,500,511	68.0	18.7%	697,843	31.6	11.7%	0	0	0	697,843	31.6	11.7%								0.4
1920	2,559,123	16.0%	1,783,779	69.7	18.9%	763,407	29.8	9.4%	0	0	0	763,407	29.8	9.4%								0.5
1930	3,170,276	23.9%	2,234,958	70.5	25.3%	918,647	29.0	20.3%	0	0	0	918,647	29.0	20.3%								0.6
1940	3,571,623	12.7%	2,567,635	71.9	14.9%	981,298	27.5	6.8%	0	0	0	981,298	27.5	6.8%								0.6
1950	4,061,929	13.7%	2,983,121	73.4	16.2%	1,047,353	25.8	6.7%	0	0	0	1,047,353	25.8	6.7%								0.1
1960	4,556,155	12.2%	3,399,285	74.6	14.0%	1,116,021	24.5	6.6%	0	0	0	1,116,021	24.5	6.6%	38,129							0.8
1970	5,082,059	11.5%	3,901,767	76.8	14.8%	1,126,478	22.2	0.9%	0	0	0	1,126,478	22.2	0.9%								0.9
1980	5,881,766	15.7%	4,457,507	75.7	14.2%	1,318,857	22.4	17.1%	0	0	0	1,318,857	22.4	17.1%	64,536	1.1		19,596	0.3			1.0
1990	6,628,637	12.7%	5,008,491	75.6	12.4%	1,456,323	22.0	10.4%	0	0	0	1,456,323	22.0	10.4%	79,825	1.2	23.7%	49,970	0.8	76,726	1.2	393.9%
2000	8,049,310	21.4%	5,804,656	72.1	15.9%	1,737,545	21.6	19.3%	0	0	0	1,737,545	21.6	19.3%	99,551	1.2	24.7%	113,689	1.4	378,963	4.7	393.9%
2010	9,535,483	18.5%	6,528,950	68.4	12.5%	2,048,628	21.5	17.9%	0	0	0	2,048,628	21.5	17.9%	122,110	1.2	22.7%	208,962	2.1	800,120	8.4	111.1%

TABLE B.1. Total North Carolina population 1790-2010 (Table by author, data source: Forstall 1996; US Census: 1900, 1920-2010; Powell 1989:572).

Year	Total Pop. NC	% Change Total	White	% White	% Change White	Black	% Black	% Change Black
1920	2,559,123		1,783,779	69.7		763,407	29.8	
1930	3,170,276	23.9%	2,234,958	70.5	25.3%	918,647	29.0	20.3%
1940	3,571,623	12.7%	2,567,635	71.9	14.9%	981,298	27.5	6.8%
1950	4,061,929	13.7%	2,983,121	73.4	16.2%	1,047,353	25.8	6.7%
1960	4,556,155	12.2%	3,399,285	74.6	14.0%	1,116,021	24.5	6.6%
1970	5,082,059	11.5%	3,901,767	76.8	14.8%	1,126,478	22.2	0.9%
1980	5,881,766	15.7%	4,457,507	75.7	14.2%	1,318,857	22.4	17.1%
1990	6,628,637	12.7%	5,008,491	75.6	12.4%	1,456,323	22.0	10.4%
2000	8,049,310	21.4%	5,804,656	72.1	15.9%	1,737,545	21.6	19.3%
2010	9,535,483	18.5%	6,528,950	68.4	12.5%	2,048,628	21.5	17.9%

TABLE B.2. Decadal percentage change in total North Carolina white and black population 1920-2010 (Table by author, data source: Forstall 1996; US Censuses 1920-2010).

Year	Amer. Indian	% Amer. Indian	% Change Amer. Indian	Asian	% Asian	Hispanic	% Hispanic	% Change Hispanic
1920								
1930								
1940								
1950								
1960	38,129	0.84%						
1970								
1980	64,536	1.10%		19,596	0.33%			
1990	79,825	1.20%	23.7%	49,970	0.75%	76,726	1.16%	
2000	99,551	1.24%	24.7%	113,689	1.41%	378,963	4.71%	393.9%
2010	122,110	1.28%	22.7%	208,962	2.19%	800,120	8.39%	111.1%

TABLE B.3. Decadal percentage change in total North Carolina American Indian, Asian and Hispanic population 1920-2010 (Table by author, data source: Forstall 1996; US Censuses 1920-2010).

	Total Pop.	% Change	Urban	% Urban	% Change	Rural	% Rural	% Change
1790	393,751		0	0		393,751	100	
1800	478,103	21.4%	0	0		478,103	100	21.4%
1810	555,500	16.2%	0	0		555,500	100	16.2%
1820	638,829	15.0%	12,502	2		626,327	98	12.8%
1830	737,987	15.5%	10,455	1	-16.4%	727,532	99	16.2%
1840	753,409	2.1%	13,310	2	27.3%	740,099	98	1.7%
1850	869,039	15.3%	21,109	2	58.6%	847,930	98	14.6%
1860	992,622	14.2%	24,554	3	16.3%	968,068	98	14.2%
1870	1,071,361	7.9%	36,218	3	47.5%	1,035,143	97	6.9%
1880	1,399,750	30.7%	55,116	4	52.2%	1,344,634	96	29.9%
1890	1,617,947	15.6%	115,759	7	110.0%	1,502,188	93	11.7%
1900	1,893,810	17.1%	186,790	10	61.4%	1,707,020	90	13.6%
1910	2,206,287	16.5%	318,474	14	70.5%	1,887,813	86	10.6%
1920	2,559,123	16.0%	490,370	19	54.0%	2,068,753	81	9.6%
1930	3,170,276	23.9%	809,847	26	65.2%	2,360,429	74	14.1%
1940	3,571,623	12.7%	974,175	27	20.3%	2,597,448	73	10.0%
1950	4,061,929	13.7%	1,368,101	34	40.4%	2,693,828	66	3.7%
1960	4,556,155	12.2%	1,801,921	40	31.7%	2,754,234	60	2.2%
1970	5,082,059	11.5%	2,310,381	46	28.2%	2,771,678	54	0.6%
1980	5,881,766	15.7%	2,822,852	48	22.2%	3,058,914	52	10.4%
1990	6,628,637	12.7%	3,832,507	58	35.8%	2,796,130	42	-8.6%
2000	8,049,310	21.4%	4,849,482	60	26.5%	3,199,828	40	14.4%
2010	9,535,483	18.5%	6,301,756	66	29.9%	3,233,727	34	1.1%

TABLE B.4. Decadal percentage change in total North Carolina rural and urban population 1790-2010 (Table by author, data source: Forstall 1996; US Censuses 1790-2010).

Note: Changing Definitions of Rural and Urban in US Census Data:

1790-1940 data = Pre-1950 urban definition.

1950-1990 data = 1950-1980 urban definition.

1990-2010 data = 2010 urban definition.

Pre-1950 urban definition.

1950-1990 data = 1950-1980 urban definition.

1990-2010 data = 2010 urban definition.

North Carolina Population 1920-2010 (US Census Data): Coastal Region

	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010
Beaufort	31,024	35,026	36,431	37,134	36,014	35,980	40,355	42,283	44,958	47,759
Bertie	23,993	25,844	26,201	26,439	24,350	20,528	21,024	20,388	19,757	21,282
Brunswick	14,876	15,818	17,125	19,238	20,278	24,223	35,777	50,985	73,141	107,431
Camden	5,382	5,461	5,440	5,223	5,598	5,453	5,829	5,904	6,885	9,980
Carteret	15,384	16,900	18,284	23,059	27,438	31,603	41,092	52,553	59,383	66,469
Chowan	10,649	11,282	11,572	12,540	11,729	10,764	12,558	13,506	14,150	14,793
Craven	29,048	30,665	31,298	48,823	58,773	62,554	71,043	81,613	91,523	103,505
Currituck	7,268	6,710	6,709	6,201	6,601	6,976	11,089	13,736	18,190	23,547
Dare	5,115	5,202	6,041	5,405	5,935	6,995	13,377	22,746	29,967	33,920
Gates	10,537	10,551	10,060	9,555	9,254	8,524	8,875	9,305	10,516	12,197
Hertford	16,294	17,542	19,352	21,453	22,718	24,439	23,368	22,523	22,977	24,669
Hyde	8,386	8,550	7,860	6,479	5,765	5,571	5,873	5,411	5,826	5,810
New Hanover	40,620	43,010	47,935	63,272	71,742	82,996	103,471	120,284	160,327	202,667
Onslow	14,703	15,289	17,939	42,047	86,208	103,126	112,784	149,838	150,355	177,772
Pamlico	9,060	9,299	9,706	9,993	9,850	9,467	10,398	11,368	12,934	13,144
Pasquotank	17,670	19,143	20,568	24,347	25,630	26,824	28,462	31,298	34,897	40,661
Pender	14,788	15,686	17,710	18,423	18,508	18,149	22,262	28,855	41,082	52,217
Perquimans	11,137	10,668	9,773	9,602	9,178	8,351	9,486	10,447	11,368	13,453
Tyrell	4,849	5,164	5,556	5,048	4,520	3,806	3,975	3,856	4,149	4,407
Washington	11,429	11,603	12,323	13,180	13,488	14,038	14,801	13,997	13,723	13,228
OBX Total Population	302,212	319,413	337,883	407,461	473,577	510,367	595,899	710,896	826,108	988,911
State NC Total Population	2,559,123	3,170,276	3,571,623	4,061,929	4,556,155	5,084,411	5,880,095	6,632,448	8,046,485	9,535,483
% Total OBX of State Total	11.81%	10.08%	9.46%	10.03%	10.39%	10.04%	10.13%	10.72%	10.27%	10.37%

TABLE B.5. Populations of 20 coastal counties (OBX) (Table by author, data sources: Forstall 1996; US Census 1900-2010).

Year	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010
Bladen	19,761	22,389	27,156	29,703	28,881	26,477	30,491	28,663	32,278	35,190
Columbus	30,124	37,720	45,663	50,621	48,973	46,937	51,037	49,587	54,749	58,098
Cumberland	35,064	45,219	59,320	96,006	148,418	212,042	247,160	274,713	302,963	319,431
Duplin	30,223	35,103	39,739	41,074	40,270	38,015	40,952	39,995	49,063	58,505
Edgecombe	37,995	47,894	49,162	51,634	54,226	52,341	55,988	56,692	55,606	56,552
Greene	16,212	18,656	18,548	18,024	16,741	14,967	16,117	15,384	18,974	21,362
Halifax	43,766	53,246	56,512	58,377	58,956	53,884	55,076	55,516	57,370	54,691
Harnett	28,313	37,911	44,239	47,605	48,236	49,667	59,570	67,833	91,025	114,678
Hoke	11,722	14,244	14,937	15,756	16,356	16,436	20,383	22,856	33,646	46,952
Johnston	48,998	57,621	63,798	65,906	62,936	61,737	70,599	81,306	121,900	168,878
Jones	9,912	10,428	10,926	11,004	11,005	9,779	9,705	9,414	10,381	10,153
Lenoir	29,555	35,716	41,211	45,953	55,276	55,204	59,819	57,274	59,636	59,495
Martin	20,828	23,400	26,111	27,938	27,139	24,730	25,948	25,078	25,546	24,505
Nash	41,061	53,782	55,608	59,919	61,002	59,122	67,153	76,677	87,385	95,840
Northampton	23,184	27,161	28,999	28,432	26,811	23,099	22,195	20,798	22,086	22,099
Pitt	45,569	54,468	61,244	63,789	69,942	73,900	90,146	108,480	133,719	168,148
Robeson	54,674	66,512	76,860	87,769	89,102	84,842	101,610	105,170	123,245	134,168
Sampson	36,002	40,082	47,440	49,780	48,013	44,954	49,687	47,297	60,161	63,431
Scotland	15,600	20,174	23,232	26,336	25,183	26,929	32,273	33,763	35,998	36,157
Wayne	43,640	53,013	58,328	64,267	82,059	85,408	97,054	104,666	113,329	122,623
Wilson	36,813	44,914	50,219	54,506	57,716	57,486	63,132	66,061	73,811	81,234
IBX Total Population	659,016	799,653	899,252	994,399	1,077,241	1,117,956	1,266,095	1,347,223	1,562,871	1,752,190
State NC Total Population	2,559,123	3,170,276	3,571,623	4,061,929	4,556,155	5,084,411	5,880,095	6,632,448	8,046,485	9,535,483
% Total IBX of State Total	25.75%	25.22%	25.18%	24.48%	23.64%	21.99%	21.53%	20.31%	19.42%	18.38%

TABLE B.6. Populations of 21 coastal counties (IBX) (Chart by author, data sources: Forstall 1996, US Census data 1900-2010).

	Total state Pop	Total CP Pop	IBX Pop	OBX Pop	% CP Pop of State	% IBX of State	% OBX of State
1920	2,559,123	961,228	659,016	302,212	38	26	12
1930	3,170,276	1,119,066	799,653	319,413	35	25	10
1940	3,571,623	1,237,135	899,252	337,883	35	25	9
1950	4,061,929	1,401,860	994,399	407,461	34	24	10
1960	4,556,155	1,550,818	1,077,241	473,577	34	24	10
1970	5,084,411	1,628,323	1,117,956	510,367	32	22	10
1980	5,880,095	1,861,994	1,266,095	595,899	32	22	10
1990	6,632,448	2,058,119	1,347,223	710,896	31	20	11
2000	8,046,485	2,388,979	1,562,871	826,108	30	19	10
2010	9,535,483	2,741,101	1,752,190	988,911	29	18	10

TABLE B.7. Decadal percentage changes in North Carolina coastal region counties' Populations: 1920-2010. (Table by author, data source: Forstall 1996; US Census for 1950, 2000, and 2010).

Note: Number Coastal Region counties is 41. Of these 20 Outer Banks (OBX) counties are those with an ocean or sound border. Under the NC Coastal Area Management Act (CAMA) these counties are subject to rules and policies of the Coastal Resources Commission. Inner Banks Counties (IBX) are inland Coastal Plain Counties east of the Fall Zone but with no ocean border.

CP OBX County	Year County Established	County Pop 2010 (US Census)	Rank order by Population 2010	CP IBX County	Year County Established	County Pop 2010 (US Census)	Rank order by Population 2010
Pasquotank	1668	40,661	13	Edgecombe	1732	56,552	9
Chowan	1670	14,793	8	Bladen	1734	35,190	5
Currituck	1670	23,547	10	Northampton	1741	22,099	3
Perquimans	1670	13,453	7	Johnston	1746	168,878	20
Beaufort	1712	47,759	14	Duplin	1750	58,505	11
Craven	1712	103,505	17	Cumberland	1754	319,431	21
Hyde	1712	5,810	2	Halifax	1758	54,691	8
Bertie	1722	21,282	9	Pitt	1760	168,148	19
Carteret	1722	66,469	16	Martin	1774	24,505	4
New Hanover	1729	202,667	20	Nash	1777	95,840	15
Tyrell	1729	4,407	1	Jones	1778	10,153	1
Onslow	1734	177,772	19	Wayne	1779	122,623	17
Hertford	1759	24,669	11	Sampson	1784	63,431	13
Brunswick	1764	107,431	18	Robeson	1787	134,168	18
Camden	1777	9,980	3	Greene	1791	21,362	2
Gates	1779	12,197	4	Lenoir	1791	59,495	12
Washington	1799	13,228	6	Columbus	1808	58,098	10
Dare	1870	33,920	12	Harnett	1855	114,678	16
Pamlico	1872	13,144	5	Wilson	1855	81,234	14
Pender	1875	52,217	15	Scotland	1899	36,157	6
				Hoke	1911	46,952	7
Total	20	988,911			21	1,752,190	

TABLE B.8. Rank ordering of North Carolina coastal counties by population in 2010 (Table by author, data source: US Census 2010).

APPENDIX C: VISIT NUMBERS TO STATE ATTRACTIONS

Visitors to North Carolina A&H Managed Historic Sites and Commissions: 1960-2014

	No. Visitors All HS Sites	HS n=	Average no. visitors per site	Fort Fisher	Brunswick	Somerset Place	Town Creek	CSS Neuse	Elizabeth II	USS NC
1960-1962	180,000	9	20000	100,000	0	0	54,192	0		
1962-1964	536,750	9	59639	344,830	51,000	0	87,176	0		
1964-1966	972,998	10	97300	350,000	107,295	0	109,568	12,286		
1966-1968	746,142	12	62179	280,041	115,411	0	111,160	34,416		
1968-1970	931,918	13	71686	292,353	195,228	17,133	102,734	46,395		
1970-1972	899,880	15	59992	221,772	178,591	40,320	111,661			
1972-1974	987,756	16	61735	268,467	203,045	43,763	88,628	53,397		
1974-1976	1,001,870	19	52730	219,705	161,527	30,196	63,713	57,648		
1976-1978	1,131,016	21	53858	224,356	192,169	19,462	61,242	44,775		
1978-1980	1,124,932	21	53568	186,980	156,402	14,728	59,223	33,411		
1980-1982	1,239,375	21	59018	252,231	135,143	15,857	62,236	43,001		
1982-1984	1,345,934	21	64092	279,992	114,361	18,827	65,522	36,476	33,400	
1984-1986	1,602,738	21	76321	261,790	102,678	19,157	69,571	28,101	306,950	
1986-1988	1,573,347	22	71516	337,479	90,548	26,231	66,441	27,411	190,007	
1988-1990	1,578,033	23	68610	301,151	115,077	23,354	62,227	24,539	145,287	
1990-1992	1,596,934	23	69432	317,572	83,749	30,425	66,080	27,388	181,471	
1992-1994	1,635,084	23	71091	328,704	79,633	36,816	78,013	34,940	187,737	
1994-1996	1,662,872	23	72299	332,565	63,970	5,137	92,221	33,465	174,680	
1996-1998	1,403,373	22	63790	252,733	54,132	46,844	62,006	34,745		
1998-2000	1,352,102	22	61459	245,454	40,041	36,113	52,170	31,114		
2000-2002	3,461,250	27	128194	1,159,302	64,620	49,785	62,070	35,050		436,708
2002-2004	3,487,298	27	129159	1,544,898	55,012	38,631	68,639	24,934		395,728
2004-2006	2,945,287	27	109085	1,059,026	66,127	28,943	45,161	21,175		371,568
2006-2008	3,192,576	27	118244	1,130,298	55,129	25,606	38,939	21,807		401,462
2008-2010	2,446,856	24	101952	1,078,544	55,129	25,606	38,939	21,807		401,462
2010-2012	2,313,090	24	96379	1,281,542	61,978	40,520	41,794	20,304	292,540	417,302
2012-2014	2,389,904	23	103,909	1,300,229	61,588	27,791	30,493	23,569		
Total	43,739,315			13,952,014	2,659,583	661,245	1,851,819	772,154		
Average/2y	1,508,252			516,741	98,503	24,491	68,586	29,698		
STDEV	874,775			436,124	53,626	14,799	22,544	13,650		
Median	1,403,373			301,151	83,749	25,606	63,713	29,608		
n=27										
NCPED 2012:										
2010-2011	1,173,982	22		640,771	30,989	20,260	20,897	10,152	146,270	208,651

TABLE C.1. Numbers of visits to NC A&H historic sites and commissions, 1960-2014. (Table by author, data sources NC A&H Biennial Reports 1960-2014; NC PED 2012).

Note on Sources:

1960-2010, 2012-2014: Visitor numbers as reported in NC A&H Biennial Reports.

2010-2012: estimated by author from doubling number visitors as given in NC PED (2012) Report for visitor numbers in 2010-2011 to State run attractions.

Elizabeth II and USS *North Carolina* (USS NC) are Commissions, rather than Historic Sites, but during years listed in table were under administrative oversight of Historic Sites Section of Archives and History.

In TABLE C.1 2008-2010 data not found so values assumed by author to be as in previous biennium.

	HS n=	No. Visitors All HS Sites	Y2Y change	Y2Y% Change	Fort Fisher	Y2Y Change	Y2Y % Change	CSS Neuse	Y2Y Change	% Y2Y Change
1960-1962	9	180,000			100,000					
1962-1964	9	536,750	356,750	198%	344,830	244,830	245%			
1964-1966	10	972,998	436,248	81%	350,000	5,170	1%	12,286		
1966-1968	12	746,142	-226,856	-23%	280,041	-69,959	-20%	34,416	22,130	180%
1968-1970	13	931,918	185,776	25%	292,353	12,312	4%	46,395	11,979	35%
1970-1972	15	899,880	-32,038	-3%	221,772	-70,581	-24%	46,396	1	0%
1972-1974	16	987,756	87,876	10%	268,467	46,695	21%	53,397	7,001	15%
1974-1976	19	1,001,870	14,114	1%	219,705	-48,762	-18%	57,648	4,251	8%
1976-1978	21	1,131,016	129,146	13%	224,356	4,651	2%	44,775	-12,873	-22%
1978-1980	21	1,124,932	-6,084	-1%	186,980	-37,376	-17%	33,411	-11,364	-25%
1980-1982	21	1,239,375	114,443	10%	252,231	65,251	35%	43,001	9,590	29%
1982-1984	21	1,345,934	106,559	9%	279,992	27,761	11%	36,476	-6,525	-15%
1984-1986	21	1,602,738	256,804	19%	261,790	-18,202	-7%	28,101	-8,375	-23%
1986-1988	22	1,573,347	-29,391	-2%	337,479	75,689	29%	27,411	-690	-2%
1988-1990	23	1,578,033	4,686	0%	301,151	-36,328	-11%	24,539	-2,872	-10%
1990-1992	23	1,596,934	18,901	1%	317,572	16,421	5%	27,388	2,849	12%
1992-1994	23	1,635,084	38,150	2%	328,704	11,132	4%	34,940	7,552	28%
1994-1996	23	1,662,872	27,788	2%	332,565	3,861	1%	33,465	-1,475	-4%
1996-1998	22	1,403,373	-259,499	-16%	252,733	-79,832	-24%	34,745	1,280	4%
1998-2000	22	1,352,102	-51,271	-4%	245,454	-7,279	-3%	31,114	-3,631	-10%
2000-2002	27	3,461,250	2,109,148	156%	1,159,302	913,848	372%	35,050	3,936	13%
2002-2004	27	3,487,298	26,048	1%	1,544,898	385,596	33%	24,934	-10,116	-29%
2004-2006	27	2,945,287	-542,011	-16%	1,059,026	-485,872	-31%	21,175	-3,759	-15%
2006-2008	27	3,192,576	247,289	8%	1,130,298	71,272	7%	21,807	632	3%
2008-2010	24	2,446,856	-745,720	-23%	1,078,544	-51,754	-5%			
2010-2012	24	2,313,090	-133,766	-5%	1,281,542	202,998	19%	20,304		
2012-2014	23	2,389,904	76,814	3%	1,300,229	18,687	1%	23,569		
n=27										
Total		43,768,706			13,876,325			772,844		
Ave/2yr		1,509,266			513,938			32,202		
STDEV		874,733			437,561			10,917		
Median		1,403,373			292,353			32263		

TABLE C.2. Biennial year-to-year change in visit numbers to NC A&H historic sites: Fort Fisher and CSS *Neuse*, 1960-2014. (Table by author, data sources: NC A&H Biennial Reports 1960-2014; NC PED 2012).

Year	Museum of History, Raleigh	Y2Y change	% Y2Y change	Maritime Museum Beaufort	Y2Y change	% Y2Y change
1960-1962	200,000					
1962-1964	252,275	52,275	26%			
1964-1966	249,978	-2,297	-1%			
1966-1968	218,867	-31,111	-12%			
1968-1970	161,177	-57,690	-26%			
1970-1972	128,985	-32,192	-20%			
1972-1974	198,122	69,137	54%			
1974-1976	282,041	83,919	42%			
1976-1978	296,960	14,919	5%			
1978-1980	303,780	6,820	2%			
1980-1982	277,722	-26,058	-9%			
1982-1984	312,816	35,094	13%			
1984-1986	360,113	47,297	15%			
1986-1988	361,019	906	0%			
1988-1990	399,577	38,558	11%			
1990-1992	310,408	-89,169	-22%			
1992-1994	347,659	37,251	12%			
1994-1996						
1996-1998				363,037		
1998-2000				394,813	31,776	9%
2000-2002	520,384			396,489	1,676	0%
2002-2004	540,509	20,125	4%	417,073	20,584	5%
2004-2006	574,420	33,911	6%	586,993	169,920	41%
2006-2008	729,900	155,480	27%	781,415	194,422	33%
2008-2010	595,739	-134,161	-18%	347,197	-434,218	-56%
2010-2012	1,100,554	504,815	85%	541,064	193,867	56%

TABLE C.3. Biennial year-to-year change in visit numbers to NC A&H Museum of History and NC Maritime Museum, Beaufort, 1960-2014. (Table by author, data sources: NC A&H Biennial Reports 1960-2014; NC PED 2012).

Note on Sources:

1960-2008: Visitor numbers as reported in NC A&H Biennial Reports.

2008-2010: Figures provided to author by Museum of History Division in 2010/2011.

2010-2012: Estimated by author from doubling number visitors as given in NC PED 2012 report for 2010-2011 visitor numbers.

1994-2000: Museum of History was not under NC A&H management but returned in 2000.

1996: NC Maritime Museum transferred from NC Department of Agriculture, to NC A&H official repository for artifacts being recovered from *Queen Anne' Revenge* Shipwreck (Site 31CR314).

Visitors to NC Managed State Attractions (DCR and DENR): 2010-2011

				2010-2011	
Region	Sites	No.Sites	No. Counties	No. Visitors	% All Total
Mountains (M)					
DCR	Historic Sites	1	1	11,769	0.1%
DCR	Museums	1	1	330,074	2%
DCR	Commissions	0	0	0	0%
DENR	State Parks	9	13	2,047,227	10%
Total		11	15	2,389,070	12%
Piedmont (P)					
DCR	Historic Sites	14	11	347,646	2%
DCR	Museums	3	2	1,083,601	5%
DCR	Commissions	1	1	97,489	0.5%
DENR	State Parks	12	15	6,544,037	32%
DENR	Museums	1	1	675,751	3%
DENR	Aquaria/Zoo	1	1	741,074	4%
Total		32	37	9,489,598	46%
Coastal Plain (CP)					
DCR IBX	Historic Sites	4	4	94,037	0.5%
DCR IBX	Museums	0	0	0	0
DCR IBX	Commissions	0	0	0	0
DENR IBX	State Parks	9	8	839,278	4%
DENR IBX	Museums	1	1	0	0
DENR IBX	Aquaria/Zoo	0	0	0	0
Total		14	13	933,315	5%
DCR OBX	Historic Sites	5	6	732,299	4%
DCR OBX	Museums	4	4	470,136	2%
DCR OBX	Commissions	3	3	527,185	3%
DENR OBX	State Parks	9	7	5,188,450	25%
DENR OBX	Museums	0	0	0	0
DENR OBX	Aquaria/Zoo	3	3	804,740	4%
Total		24	23	7,722,810	38%
ALL TOTAL		81	88	20,534,793	100

TABLE C.4. Summary of numbers of visits to all NC State Attractions in 2010-2011. (Table by author, data source: NCPED 2012).

NC Agency	State Attraction	No. Sites	Open Sites (n=)	Total No. Visitors	Average No. Visitors/site	STEDEV	% of Total Visitors to Agency Attractions	% of Total Visitors to All Attractions
DCR	Historic Sites	23	22	1,173,982	53,363	130,262	32%	6%
	Museums	8	8	1,883,811	235,476	196,174	51%	9%
	Commissions	4	4	624,674	156,169	46,743	17%	3%
DCR Totals		35	34	3,682,467	108,308		100%	18%
DENR	Museums	2	1	675,751	675,751		4%	3%
	Aquaria, Pier and Zoo	5	4	1,545,814	386,453	303,167	9%	8%
	Parks and Recreation Areas	39	37	14,618,992	395,108	396,209	87%	71%
DENR Totals		46	42	16,840,557	400,966		100%	82%
Totals All Sites		81	76	20,523,024	270,040			100%

TABLE C.5. Summary of visit numbers to all NC State Attractions in 2010-2011. (Table by author, data source: NC PED 2012).

State Parks and Recreation Areas	County	Visitor Numbers
Bay Tree Lake	Bladen	0
Carvers Creek	Cumberland	0
Carolina Beach	New Hanover	556,248
Chimney Rock	Rutherford	199,124
Cliffs of the Neuse	Wayne	387,185
Crowders Mountain	Gaston	395,829
Dismal Swamp	Camden	73,991
Elk Knob	Watauga	24,772
Eno River	Durham/Orange	419,175
Falls Lake	Wake/Durham/Granville	779,621
Fort Fisher	New Hanover	863,822
Fort Macon	Beaufort	1,384,524
Goose Creek	Beaufort	259,643
Gorges	Transylvania	81,377
Grandfather Mountain	Avery/Caldwell/Watauga	17,233
Hammocks Beach	Onslow	91,681
Hanging Rock	Stokes	552,903
Haw River	Guilford	24,058
Jockey's Ridge	Dare	1,610,688
Jones Lake	Bladen	33,962
Jordan Lake	Chatham	866,119
Kerr Lake	Vance & Warren	1,153,120
Lake James	McDowell	495,037
Lake Norman	Iredell	524,772
Lake Waccamaw	Columbus	86,068
Lumber River	Robeson	78,024
Mayo River	Rockingham	37,087
Medoc Mountain	Halifax	74,180
Merchants Millpond	Gates	276,489
Morrow Mountain	Stanly	447,565
Mount Mitchell	Yancy	346,266
New River	Ashe/Allegheny	250,984
Pettigrew	Washington	71,364
Pilot Mountain	Surry/Yadkin	452,007
Raven Rock	Harnett	156,527
Singletary Lake	Bladen	23,332
South Mountains	Burke	205,438
Stone Mountain	Wilkes/Allegheny	426,996
William B. Umstead	Wake	891,781
TOTAL No. Visitors		14,618,992
Open Parks n=37	Total no. Parks = 39	
Average No. Visitors		395,108
STDEV		396,209

TABLE C.6. Visitor numbers in 2010-2011 to all NC DENR state parks and recreation areas (Table by author, data source: NCPED (2012)).

Theme/no. sites	CP OBX	CP IBX	P	Mt	Total	% total
Place-Person (PP)	1	1	5	1	8	22%
Regional History (RH)	1	0	2	1	4	11%
Military (Mi)	2	2	4	0	8	22%
Maritime (Ma)	4	0	0	0	4	11%
Agriculture/Industry A/I	1	0	5	0	6	17%
Settlement (S)	3	1	1	0	5	14%
Cultural (C)	0	0	1	0	1	3%
Total	12	4	18	2	36	100%

TABLE C.7. Numbers of visits to DCR Sites by region and theme. (Table by author, data source NC PED (2012) [CP = Coastal Plain; OBX = Outer Banks Counties; IBX = Inner Banks Counties; P = Piedmont; Mt = Mountains])

	PP	RH	Mi	Ma	A/I	S	C	Total	% Total
CP OBX	172,264	71,828	849,422	544,578	20,260	71,268	0	1,729,620	47%
CP IBX	11,275	0	48,570	0	0	34,192	0	94,037	3%
P	152,468	626,614	61,569	0	210,201	20,897	456,987	1,528,736	41%
Mt	11,769	330,074	0	0	0	0	0	341,843	9%
Total	347,776	1,028,516	959,561	544,578	230,461	126,357	456,987	3,694,236	100.00%
% Total	9%	28%	26%	15%	6%	3%	12%	100%	

TABLE C.8. Numbers of visits to DCR Sites by region and theme. (Table by author, data source: NCPED 2012. [CP = Coastal Plain; OBX = Outer Banks Counties; IBX = Inner Banks Counties; P = Piedmont; Mt = Mountains])

Museums	County	Theme	Period	Visitor Numbers
Graveyard of the Atlantic Museum	Dare	Regional History/Maritime	Colonial to Present	69,164
Mountain Gateway Museum and Heritage Center	McDowell	Regional History	All	330,074
Museum of the Albemarle	Pasquotank	Regional History	All	71,828
Museum of the Cape Fear Complex	Cumberland	Regional History/Military	All	76,337
Museum of History	Wake	Regional History	All	550,277
North Carolina Maritime Museum, Beaufort	Carteret	Regional History/Maritime	All	270,532
North Carolina Maritime Museum, Southport	Brunswick	Regional History/Maritime	All	58,612
North Carolina Museum of Art	Wake	Cultural	All	456,987
TOTAL No. Visitors				1,883,811
n=8				
Average No. Visitors				235,476
STDEV				196,174

TABLE C.9. Numbers of visits in 2010-2011 to NC A&H museums by county and theme. (Table by author, data source NCPED 2012).

Historic Sites	County	Theme	Period	Visitor Numbers
Alamance Battleground	Alamance	Military	Colonial to Civil Wa	11,601
Aycock Birthplace	Wayne	Place - Person - Governor	19th century	11,275
Bennett Place	Durham	Military	Civil War	14,366
Bentonville Battlefield	Johnston	Military	Civil War	38,418
Brunswick Town/ Fort Anderson	Brunswick	Settlement/Military	Colonial to Civil Wa	30,989
CSS Neuse/Richard Caswell Memorial	Lenoir	Military	Revolutionary & Civ	10,152
Charlotte Hawkins Brown Birthplace	Guilford	Place - Person	19th century	0
Duke Homestead	Durham	Agriculture - Tobacco	Antebellum19th cent	18,381
Fort Dobbs	Iredell	Military	French & Indian War	18,528
Fort Fisher	New Hanover	Military	Civil War	640,771
Historic Bath	Beaufort	Settlement	Colonial	18,027
Historic Edenton	Chowan	Settlement	Colonial on	22,252
Historic Halifax	Halifax	Settlement	Colonial to Antebell	34,192
Historic Stagville	Durham	Agriculture - Plantation	Civil War	15,481
Home Creek Farm	Surry	Agriculture - Apples	Early 20th century	33,767
House in the Horseshoe	Moore	Military	Revolutionary War	17,074
President JamesK. Polk	Mecklenberg	Place - Person - President	19th century	12,602
Reed Gold Mine	Cabarrus	Industrial - mining	19th century	45,083
Somerset Place	Washington/Tyrell	Agriculture - Plantation	Antebellum	20,260
State Capital	Wake	Place - Political	19th century	108,235
Thomas Wolfe Memorial	Buncombe	Place - Person - Literary	19th century	19,862
Town Creek Indiam Mound	Montgomery	Settlement	11th Century	20,897
Vance Birthplace	Buncombe	Place - Person - Governor	18-19th Century	11,769
TOTAL No. Visitors				1,173,982
n=23				
Average No. Visitors (Open sites n=22)				53,363
STDEV				130,262

TABLE C.10. Numbers of visits to A&H State Historic Sites in 2010-2011. (Table by author, data source: NCPED (2012).

Commissions	County	Theme	Period	Visitor Numbers
Battleship North Carolina	New Hanover	Military	WWII	208,651
North Carolina Transportation Museum	Rowan	Industrial - Transport	19th-20th Century	97,489
Roanoke Festival Park	Dare	Regional History/Maritime	All	146,270
Tryon Palace	Craven	Place - Person - Governor	All	172,264
TOTAL No. Visitors				624,674
n=4				
Average No. Visitors				156,169
STDEV				46,743

TABLE C.11. Numbers of visits State Commissions in 2010-2011. (Table by author, data source: NCPED (2012).

DENR Museums	County	Theme	Period	Visitor Numbers
NC State Museum of Natural Sciences	Wake	Research and Education	All	675,751
NC Museum of Forestry	Columbus	Education		
TOTAL No. Visitors				675,751
n=1				
Average No. Visitors				
STDEV				

TABLE C.12. Numbers of visits to DENR Museums in 2010-211. (Table by author, data source: NCPED (2012).

**APPENDIX D: FEDERAL AND STATE LEGISLATION AFFECTING
NC ARCHIVES AND HISTORY 1903-2015**

Federal and State Legislation Affecting North Carolina Archives and History 1903-2015

Year	Federal Legislation	State Legislation
1900-1909	1	2
1910-1919	1	3
1920-1929	0	0
1930-1939	3	4
1940-1949	2	2
1950-1959	2	1
1960-1969	5	5
1970-1979	10	11
1980-1989	2	6
1990-1999	2	4
2000-2009	1	1
2010-2015	0	2
Total	29	41

TABLE D.1. Biennial totals for numbers of federal and state legislations directly affecting A&H and UCH in North Carolina 1900-2015. (Table by author, data sources: NC Session Laws; NC A&H Biennial Reports; Varmer 2014; <https://archaeology.ncdcr.gov/programs/environmental-review/laws>).

YEAR	FEDERAL LEGISLATION	STATE LEGISLATION
1903		GS Ch.767 Act to Establish An Historical Commission Established <i>North Carolina Historical Commission</i> (NCHC), duties, organization, appropriation, publishing
1906	Antiquities Act: President power to set aside national monuments on federal land; historic & scientific resources; fines and punishment for damage; permit system for investigations; Government could acquire land for national monuments. Problem: Antiquity not defined.	
1907		GS Ch. 714 An Act to Amend Chapter 96 of the Revisal of 1905 Relating to the State Historical Commission. Created commission of five members, governor appointed, duties, functions, no salary or per diem but allowed expenses when attending to official work. (BR 1903-1907)
1914		Responsibility for Hall of History from Museum of Natural Sciences (Dept. Agriculture) to NCHC by General Assembly
1915		GA established Legislative Reference Dept. under NCHC (moved in 1933 to Attorney General's Dept.).
1915		First NC State Park established?? On part of Mount Mitchell
1916	National Park Service (NPS) Organic Act: established NPS; promote & regulate use; conservation for public enjoyment; pass on [stewardship]; investigate, study, monitor, list, inventory, id threats; educational use, - resources of national significance.	
1933	Tennessee Valley Authority Act: develop human & natural resources; dams; economy & agriculture; TVA employed archaeologists	Legislative Reference Dept. under NCHC (moved to Attorney General's Dept.).
1935	PL 74-292 Historic Sites Act (HSA): preservation = national policy; NPS authorized secure data, locate, record, investigate, research, acquire, restore & preserve, mark & commemorate properties, operate, manage, education, fines, advisory board, public use, National significance. National Landmark Program	GS Ch. 70 (1935) Article 1: Indian Antiquities: Private owners urged to: refrain from excavation, or destroy remains without co-op State Museum; encouraged to give relics to state; on public lands - report and preserve; permits.
1935	Emergency Relief Appropriation Act: established Works Progress Administration (WPA) - incl. archaeology part FDR "New Deal"	
1935		GS Ch. 197 NC Highway Historical Marker Program: Established as state program; \$5,000 in appropriations from State Highway and Public Works Commission
1935		GS Ch. 265 Public Records Law -Established and defined public records and need for their preservation
1945	River Basin Survey - Missouri River: NPS to co-ordinate salvage archaeology in advance dams and reservoirs, with non federal agencies; involved professional archaeologists; interagency agreements;	GS Ch. 121 NC Archives and History Act (1945) Established <i>State Department of Archives and History (SDAH)</i>
1949	National Trust & Historic Preservation Act: to further HAS; public participation, NPO, charity, education, donations	
1953	Submerged Lands Act: established states title to navigable bottom lands; State governors give claim to title and control over abandoned shipwrecks in state waters	
1955		GS Ch. 121 NC Archives and History Act (1955) Most historic sites transferred from Dept. Conservation and Development to SDAH - apart from Fort Macon and Somerset Place - as were state parks.
1956	Federal Aid Highway Act: authorized limited salvage arch in advance highway planning & construction.	
1960	PL 86-523 Reservoir Salvage Act (RSA): following Missouri Basin Survey - protection of data that might be lost. Arch allowed before work starts but no funding; incentive but no authority; preservation of data; only NPS authority to request funds.	
1961		GS Ch. 132 Public Records Act - expanded duties and responsibilities of Dept. Archives and History for managing, and preserving all government and agency official records, as public records
1963		Established a Preservation Laboratory at Fort Fisher, administered by Dept. Archives and History
		GS Ch. 210 An Act to Amend Chapter 121 of the General Statutes as to the Purchase of Historic Properties, to Establish a Historic Sites Advisory Committee and to Amend Chapter 143 of the General Statutes as to the Appropriation of Funds for Historic Sites
1966	PL 89-665 National Historic Preservation Act (NHPA) (1966) Sec Interior & NPS lead agency; National Register (NR); SHPO, THPO, Advisory Council on Historic Properties. Section 101 - NR, standards, SHPOs (State level), grants, ACHP. Section 106 - any federal funded activity take account of impact on historic/arch properties eligible for listing on NR. Section 110 - registration and inventory all sites on federal properties but no money. National heritage; preservation for now and future, public interest; better knowledge to better planning.	
1966	PL 89-670 Department of Transportation Act – Federal agencies and projects to assess and mitigate for possible effects of projects and activities on National Register listed properties and those eligible for listing	

TABLE D.2. Federal and state legislations directly affecting A&H and UCH in North Carolina 1903-1966. (Table by author, data sources: NC Session Laws; NC A&H Biennial Reports; Varmer 2014; <https://archaeology.ncdcr.gov/programs/environmental-review/laws>).

YEAR	FEDERAL LEGISLATION	STATE LEGISLATION
1967		GS Ch. 533 An Act to Declare Ownership of All Bottoms in Certain Waters Within the State and to Establish Procedures in Conducting Salvage of Abandoned Shipwrecks and Other Underwater Archaeological Sites. Section 1 confirmed state's title to bottomlands of navigable waters. Section 2 - established responsibility of Archives and History to implement and promulgate rules and regulations to "preserve, protect, recover, and salvage" all or any underwater properties defined in Section 1. (Subject to GS. Ch82 "Wrecks" and GS Ch210 (1963) and any statute of the US)
1967		GS Ch.121 Archives and History Act, Article 3. Salvage of Abandoned Shipwrecks and Other Underwater Archaeological Sites. Surveillance, protection, preservation, survey, recovery Title to bottom lands, navigable water, 1 marine league seaward extreme low watermark; unclaimed more 10 years; NCDCCR; rules to preserve, protect, recover or salvage; professional staff; permits; licenses; apportionment of finds; criminal checks (19??); violation - misdemeanor
??	36CFR60 Criteria of Significance for National Register: regulations and procedures for implementing National Register eligibility and listing of significant properties.	
1968	Federal Aid Highway Act	
1969	PL 91-190 National Environment Policy Act (NEPA): Federal agencies - activity - impact studies cultural and natural - impacts on environment, history, arch resources; National policy - people rights to healthy environments + responsibility for maintaining; Environment Impact Statements (EIS); for archaeology/history - NHPA precedence over NEPA; 1992 - better mesh of two acts;	
1970	Clean Air Act Amendment	
1970	Reorganization Orders 3 & 4 (Nixon): established EPA and NOAA	
1970	Water Quality Improvement Act	
1971	EO 11593: Federal Agencies to conduct inventories under Section 106, of properties that might be eligible for NR, rather than in NR, more arch sites within remit.	Executive Order XVI Protection and Enhancement of Historical and Cultural Heritage of North Carolina. State agencies to survey properties in their jurisdiction and consider eligibility for listing on National Register. And ensure state programs and plans enhance and contribute to preservation of culturally significant properties.
1971		Executive Order - Reorganization State Government
1971		GS Ch. 113A North Carolina Environmental Policy Act. To encourage wise, productive and beneficial use of State's natural resources; State agencies to undertake environmental assessments to consider effect of their activities on natural resources on public land and/or using public resources; public education programs;
1971		GS Ch.143 Open Meetings Law - rights of public to access information held by government and its agencies but also are exclusions
1972	National Marine Sanctuaries Act	GS Ch.121 Established Department of Art, Culture and History; Office of Archives and History within Department establish Office of Archives and History within Department
1972	Marine Mammal Protection Act: effective end US whaling	
1972	Coastal Zone Management Act (CZMA)	
1973		GS Ch.113 Conservation & Development Article 7: Coastal Area Management Act (CAMA) (1973): Conservation and Development; 20 coastal counties; co-op state & local government; coastal lands and waters - resources - protection, preservation, development & management; public access; productivity; included: "preservation and enhancement of historic, cultural, and scientific aspects of coastal areas; coastal resources commission - guidelines - included permit system; grants for plans; 113-113 - can designate areas of environmental concern including historic areas; erosion control; permits, penalties; coastal reserves.
1973		GS Ch. 121 Archives and History Act Article 1 - established <i>Department Cultural Resources</i> ; and <i>Division of Archives and History</i> within Department; included Archaeology Section established. GS Ch.143 - NCDCCR Creation, powers, duties, functions; NC Historical Commission established.
1973		GS Ch. 121-12 – North Carolina Historical Commission redefined and to be responsible for advising and coordinating on protection of Properties on National Register
1973		GS Chapter 70 (1935, 1973) Article 1: Indian Antiquities - amendment
1974	Archaeological & Historic Preservation Act (AHPA): aka: Moss-Bennett Bill; arch Data Protection Act - Extended RSA, and HSA to all Federal activities; licensed; assessed re affect on arch data; Sec Interior; agencies to protect or give 1% of funds to Sites of Interest to protect.	
1975		GS Ch.132 (1935 Ch.265) Public Records Act - extended to cover computerized records and other forms data storage and retrieval
1978	PL 95-341 American Indian Religious Freedom Act. 1st Amendment rights to Native Americans; religious rights override HPA; access to religious sites and sacred objects	NC CAMA - Coastal Zone Management Program - received Federal Approval
1979	PL 96-95 Archaeological Resources Protection Act (ARPA): strengthen Antiquities Act - looting & vandalism; defined age of antiquity to more than 100 years (amended to 50 years); lowered cost of felony action - fines 0 + confiscation of equipment; extended permit program; Uniform CFR to be written - agencies - NPS, Bureau land management, FWS, USACE, TVA, Forest Service - 4.5 years to agree	

TABLE D.3. Federal and state legislations directly affecting A&H and UCH in North Carolina 1967-1979. (Table by author, data sources: NC Session Laws; NC A&H Biennial Reports; Varmer 2014; <https://archaeology.ncdcr.gov/programs/environmental-review/laws>).

YEAR	FEDERAL LEGISLATION	STATE LEGISLATION
1981		GS Chapter 70 Article 2: Archaeological Resources Protection Act NC: State Lands; remains evidence human activity; >50 years; locations can be kept confidential; no sell, purchase, exchange, transport, receive, penalties - \$ and forfeiture; permits for excavation; NCDCCR foster communication and information exchange with private and prof. archaeologists but not cover UCH
1981		GS Chapter 70 Article 3 NC Unmarked Human Burial & Human Skeletal Remains Protection Act: protection and procedures in event of discovery of unmarked human burials and human skeletal remains
1984	ARPA CFR agreed - amended 1988 - all agencies to survey, inventory, lowered threshold damage to \$500.00. 1990 amendment > public awareness programs.	
1985		NC Administrative Code Section 0.0700 for NC ARPA Arch activity - permits; procedures; qualifications; reporting; resources and records property of state; accessible for scientific, historic, education, research; transfers and loans can be approved by Secretary of NCDCCR or agent.
1987		GS Ch. 113 Conservation & Development (DENR) Article 2C: State Parks Act
1987	PL 100 298 Abandoned Shipwreck Act Federal responsibility for navigable waters; transfer management responsibility to States; supersede Admiralty and Salvage Law; public access; recreation & education; 3 nm of coast and internal navigable waters if: 1) embedded in submerged land; 2) coral formations protected by state; 3) on or eligible for NR; US government retain title to warships and ships under sovereign immunity; States can use federal \$ to study, interpret, protect, preserve	
1988		GS Ch.70 Article 2 - Administration Code
1989		NC Admin Code - T07:04R.1000 Re GS Chapter 121 Article 3 Abandoned shipwrecks = sunken ships, boats, watercraft, associated equip & materials. UW artifacts - all things with evidence human activity. Permits - requirements - funds, equipment, facilities, experience, knowledge, methods, conservation, records, curation, reporting, ownership & division finds, compensation: "no permit for recovery unless proposed project consistent with Department Management Plan for areas and all recovered artifacts as intact collection.; sport and diving permits,
1990	36CFR79 Curation of Federally Owned and Administered Archaeological Collections	
1990	PL 101-601 Native American Grave Protection and Repatriation Act (NAGPRA)	
1991		GS Ch. 70 Article 4 North Carolina Record Program: established a voluntary program for recording, preserving and protecting archaeological resources on private lands.
1991		GS Ch. 113A North Carolina Environmental Policy Act. – Agencies to adopt rules to establish minimum criteria and environmental assessment procedures for environmental impact statements for agency projects.
1995		GS Ch.132-1-10 Public Records Law – amendments – public records as property of the people have right of access to most public records.
1996		HB 53 Current Operations Act of 1996 – performance based budgeting for public agencies (PPB) legislation in NC
2005	Sunken Military Craft Act	GS Ch.121-15.1 Archives and History Act, Article 3. Salvage of Abandoned Shipwrecks and Other Underwater Archaeological Sites – Criminal Records checks required for applicants for permits or licenses for any type of work on underwater sites
2009		
2015		GS Ch.121 Article 5: Amendment added Article 5 "Museums and Archives Repository Property" includes 121-15 (b) - all records, images, relics etc. of shipwrecks and UCH held by public agencies are Public Record, with no limitation on their use as under GS Ch.132-1 - "Blackbeard's Law"
2015		GS Ch. 121 Established <i>Department Natural and Cultural Resources</i>

TABLE D.4. Federal and state legislations directly affecting A&H and UCH in North Carolina 1981-2015. (Table by author, data sources: NC Session Laws; NC A&H Biennial Reports; Varmer 2014; <https://archaeology.ncdcr.gov/programs/environmental-review/laws>).

**APPENDIX E: STATE (NC) APPROPRIATIONS FOR ARCHIVES AND HISTORY
FISCAL BIENNIAL YEARS 1958/1960-2012/2014**

**North Carolina (NC) General Fund (GF) and A&H Appropriations (Recurring R\$):
1958/1960-2012-2014**

Year	Total GF \$	BY2BY Change GF\$	BY2BY % Change GF\$	A&H \$ from GF	BY2BY Change A&H \$ from GF	BY2BY % Change A&H \$ from GF
1958-1960	548,593,177			725,788		
1960-1962	663,271,336	114,678,159	21%	1,106,635	380,847	52%
1962-1964	813,933,962	150,662,626	23%	1,243,108	136,473	12%
1964-1966	977,166,836	163,232,874	20%	1,633,865	390,757	31%
1966-1968	1,209,188,055	232,021,219	24%	1,962,535	328,670	20%
1968-1970	1,704,700,000	495,511,945	41%	2,747,871	785,336	40%
1970-1972	2,113,400,000	408,700,000	24%	4,018,524	1,270,653	46%
1972-1974	2,886,100,000	772,700,000	37%	4,424,225	405,701	10%
1974-1976	3,576,700,000	690,600,000	24%	5,758,987	1,334,762	30%
1976-1978	4,214,400,000	637,700,000	18%	7,133,640	1,374,653	24%
1978-1980	5,422,600,000	1,208,200,000	29%	10,702,553	3,568,913	50%
1980-1982	6,679,800,000	1,257,200,000	23%	13,607,318	2,904,765	27%
1982-1984	7,481,200,000	801,400,000	12%	14,017,306	409,988	3%
1984-1986	9,647,100,000	2,165,900,000	29%	22,058,833	8,041,527	57%
1986-1988	11,509,500,000	1,862,400,000	19%	26,382,537	4,323,704	20%
1988-1990	13,921,100,000	2,411,600,000	21%	23,604,144	-2,778,393	-11%
1990-1992	15,900,100,000	1,979,000,000	14%	30,974,069	7,369,925	31%
1992-1994	17,527,400,000	1,627,300,000	10%	31,606,302	632,233	2%
1994-1996	20,300,000,000	2,772,600,000	16%	33,047,728	1,441,426	5%
1996-1998	22,193,400,000	1,893,400,000	9%	31,463,591	-1,584,137	-5%
1998-2000	27,349,300,000	5,155,900,000	23%	40,940,969	9,477,378	30%
2000-2002	28,580,400,000	1,231,100,000	5%	47,741,876	6,800,907	17%
2002-2004	29,218,300,000	637,900,000	2%	50,825,196	3,083,320	6%
2004-2006	33,099,400,004	3,881,100,004	13%	49,216,604	-1,608,592	-3%
2006-2008	39,525,600,000	6,426,199,996	19%	57,571,603	8,354,999	17%
2008-2010	41,157,900,000	1,632,300,000	4%	57,849,218	277,615	0%
2010-2012	38,861,400,000	-2,296,500,000	-6%	52,274,728	-5,574,490	-10%
2012-2014	40,980,500,000	2,119,100,000	5%	53,595,891	1,321,163	3%
Total	428,062,453,370			678,235,644		

TABLE E.1. Recurring appropriations (R\$) NC General Fund (GF) and from GF to A&H for biennial fiscal years 1958/1960 to 2012/2014. (Table by author, data sources: A&H Biennial Reports (NC A&H Biennial Reports 1960-2016; NC State Budgets).

Note:

Data Sources for total NC General Fund (GF) appropriations: NC Governors' Requested Budgets (excluding special project appropriations):

1950-1963 State of North Carolina, The Budget, 1965-1967. (NC 1965:364)

1963-1968 State of North Carolina, The Budget, 1969-1971, Volume IV. (NC1969:A31)

1968-2015 State of North Carolina, The Budget, 2013-2015. (NC 2013:299)

Data sources for A&H appropriations from NC General Fund for Years 1964-2014:

1964-2014 Fifty-Fifth Biennial Report, NC Office of Archives and History 2012-2014 (NC A&H 2014:155).

Biennial Fiscal Year Recurring Appropriations, 1960-2014, to A&H from GF, and from A&H to Archaeology, Historic Sites, Museum of History, and Maritime Museum (excluding special project and capital fund appropriations).

Years	Total GF \$	A&H from GF	Arch \$	Arch/HP\$	All HS \$	NCMM \$	MOH \$
1958-1960	548,593,177	725,788			181,085		
1960-1962	663,271,336	1,106,635			226,531		110,294
1962-1964	813,933,962	1,243,108			352,964		184,567
1964-1966	977,166,836	1,633,865			560,173		240,051
1966-1968	1,209,188,055	1,962,535			616,895		291,060
1968-1970	1,704,700,000	2,747,871			1,079,627		353,479
1970-1972	2,113,400,000	4,018,524			2,180,706		
1972-1974	2,886,100,000	4,424,225	144,633		2,645,694		
1974-1976	3,576,700,000	5,758,987	611,810		3,370,998		981,327
1976-1978	4,214,400,000	7,133,640	274,394	834,211	2,520,480		818,996
1978-1980	5,422,600,000	10,702,553		4,060,247	3,428,678		
1980-1982	6,679,800,000	13,607,318		4,244,955	4,248,644		1,299,181
1982-1984	7,481,200,000	14,017,306		3,765,438	4,555,849		1,645,071
1984-1986	9,647,100,000	22,058,833		4,305,438	4,555,849		852,031
1986-1988	11,509,500,000	26,382,537			9,283,085		3,060,395
1988-1990	13,921,100,000	23,604,144		3,217,805	8,655,839		3,764,906
1990-1992	15,900,100,000	30,974,069		6,001,077	10,221,407		4,249,323
1992-1994	17,527,400,000	31,606,302		4,200,826	10,716,350		7,810,154
1994-1996	20,300,000,000	33,047,728		4,575,101	10,893,493		8,336,270
1996-1998	22,193,400,000	31,463,591		5,049,382	5,291,388	1,084,907	
1998-2000	27,349,300,000	40,940,969		2,884,635	6,741,996	1,743,948	
2000-2002	28,580,400,000	47,741,876		3,055,132	6,741,996	2,276,314	11,110,111
2002-2004	29,218,300,000	50,825,196	657,915		6,741,996	1,993,313	10,022,891
2004-2006	33,099,400,004	49,216,604	1,445,074		5,040,960	2,056,291	14,531,189
2006-2008	39,525,600,000	57,571,603	2,277,163		6,857,356	3,244,598	15,000,411
2008-2010	41,157,900,000	57,849,218	2,259,594		17,712,017	2,570,537	14,544,290
2010-2012	38,861,400,000	52,274,728	2,401,598		16,501,715	3,318,899	12,494,179
2012-2014	40,980,500,000	53,595,891	2,123,861		10,957,750	3,410,125	11,569,962

TABLE E.2. A&H appropriations from General Fund (GF), and allocation from A&H to archaeology, historic sites, Museum of History, NC Maritime Museum. (Table by author, data sources: NC A&H Biennial Reports 1960-2016). Key: GF = General Fund; A&H = Archives and History; Arch = Archaeology; Arch/HP = Archaeology and Historic Preservation Section; HS = Historic Sites; NCMM = NC Maritime Museum, Beaufort; MOH = NC Museum of History, Raleigh.

Note:

Archaeology: A&H employed archaeologists since the 1930s but was not a separate section within A&H until 1973. From 1977 to 2003 Archaeology was combined administratively with Historic Preservation (HP).

The North Carolina Maritime Museum (NCMM) was first established under the NC Department of Agriculture. In 1997 NCMM was designated the official repository for artifacts recovered from *Queen Anne's Revenge* shipwreck and transferred to DCR/A&H in 1997.

Museum of History (MOH), was established as the "Hall of History" and administered by A&H from early 20th century except for fiscal years 1996/1998-1998/2000; thus, no appropriations recorded in NC A&H Biennial Reports for these years. During 1970s, it was administered under Historic Sites and NC A&H Biennial Reports did not distinguish its separate appropriations.

1959/1960 to 2013/2014	Total Appropriation \$	No. Years	Average \$ per Year	Average \$/Yr as % of Average Total A&H \$/yr
HS	221,006,846	54	4,092,719	33%
MoH	125,699,282	46	2,732,593	22%
Arch & HP	53,049,076	26	2,040,349	17%
NCMM	21,698,932	17	1,276,408	10%
HP	19,259,738	11	1,750,885	14%
Arch	12,051,409	19	634,285	5%
NC A&H	677,918,533	55	12,325,792	100%
NC GF	427,798,123,460	55	7,778,147,699	

TABLE E.3. Total recurring appropriations for sections within A&H from 1959/1960 to 2013/2014. (Table by author, data sources: NC A&H Biennial Reports 1960-2016). Key: GF = General Fund; A&H = Archives and History; Arch = Archaeology; Arch/HP = Archaeology and Historic Preservation Section; HS = Historic Sites; NCMM = NC Maritime Museum, Beaufort; MOH = NC Museum of History, Raleigh.

Note: Sources:

North Carolina Department of Archives and History Biennial Reports (NC A&H):
 NC A&H 1960:93; NC A&H 1962:115; NC A&H 1964:131; NC A&H 1974:78; NC A&H 1976:106;
 NC A&H 1979:120; NC A&H 1981:134; NC A&H 1983:99; NC A&H 1985:104; NC A&H 1987:96;
 NC A&H 1991:72; NC A&H 1993:76; NC A&H 1995:80; NC A&H 1997:72; NC A&H 1999:81;
 NC A&H 2001:84; NC A&H 2003:88; NC A&H 2005:95; NC A&H 2007:95; NC A&H 2009:99;
 NC A&H 2011:136; NC A&H 2013:134; NC A&H 2015:154

APPENDIX F: NORTH CAROLINA PLAYERS' INTEREST INDICATOR DATA FOR SIX UCH CASE STUDY SITES AND SIX ASSOCIATED STATE ATTRACTIONS (ASA)

UCH Site: Players' Interest Indicator Data: *Modern Greece*

<i>Modern Greece</i>	NEI001	New Hanover County	New Inlet	Ocean/Inlet	Onslow Bay S	OBX			
Interest:	Public	Political	Professional	Reading public	Visiting	Legislation	Appropriation	Google Scholar	UAB Biblio
Keyword Search:	"Modern Greece" and "Fort Fisher"								
Indicator:	Number Relevant Articles	Number Visitors	Number Acts	Amount Non-Recurring (NR) \$	Number Publications	Number References (by ID#)			
1960-1962	12								
1962-1964	8		1	25,718	1				
1964-1966	1				2	1			
1966-1968	9		1						
1968-1970	0								
1970-1972	1		1	29,370					
1972-1974	0				1				
1974-1976	0								
1976-1978	2				3	3			
1978-1980	0								
1980-1982	0								
1982-1984	1								
1984-1986	0				3				
1986-1988	1								
1988-1990	2				1				
1990-1992	0				1				
1992-1994	0								
1994-1996	2				2				
1996-1998	1								
1998-2000	1				2				
2000-2002	1					1			
2002-2004	2				1				
2004-2006	0				4				
2006-2008	0				1				
2008-2010	1				3				
2010-2012	18				3				
2012-2014	7				5				
2014-2016	4				4				
2016-2018*	1				1				
Totals	75	NA	3	55,008	38	5			
No Years	56		56	56	56	56			
Av/Yr	1.3		0.05	982	0.7	0.08			
Sources	ANHC db (ann)	See Fort Fisher Historic Site	NC Session Laws (online)	NC Session Laws (online)	Google Scholar 2018.01.14	UAB Biblio. (2016)			
* to 6/30/2017									
2018.04.07									

TABLE F.1. *Modern Greece*: players' indicator data. (Table by author, data sources as in table and Chapter 2).

UCH Site: Players' Interest Indicator Data: CSS Neuse

CSS Neuse	NUR001		Lenoir County	Kinston	River Neuse	River	IBX
Interest:	Public			Political		Professional	
	Reading public	Reading public	Visiting	Legislation	Appropriation	Google Scholar	UAB Biblio
Keyword Search:	"CSS Neuse"	"Ram Neuse"				"CSS Neuse"	
Indicator:	Number Relevant Articles		Number Visitors	Number Acts	Amount Non-Recurring (NR) \$	Number Publications	Number References (by ID#)
1960-1962	0	55					
1962-1964	2	45		1	25,718		
1964-1966	0	23	12,286	1	24,000	1	
1966-1968	0	4	34,416	2	75,000	1	
1968-1970	0	8	46,395	1	135,000		1
1970-1972	0	3	46,395				
1972-1974	1	3	53,397		54,879	2	
1974-1976	0	6	57,648				
1976-1978	0	6	44,775			1	
1978-1980	0	3	33,411				
1980-1982	2	2	43,001			3	2
1982-1984	0	1	36,476			2	
1984-1986	4	0	28,101			2	
1986-1988	1	0	27,411		20,000	2	
1988-1990	0	0	24,539			1	
1990-1992	0	1	27,388			3	
1992-1994	0	1	34,940			1	
1994-1996	3	1	33,465			2	
1996-1998	6	0	34,745			1	
1998-2000	9	2	31,114		323,000	1	
2000-2002	9	2	35,050		465,000	7	1
2002-2004	14	2	24,934			4	
2004-2006	11	1	21,175			3	
2006-2008	37	3	21,807			3	
2008-2010	72	8	21,807	2	2,925,000	7	
2010-2012	67	5	20,304			6	
2012-2014	91	5	23,569	1		7	
2014-2016	102	6	23,569			7	
2016-2018*	45	5					
Totals	476	201	842,118	8	4,047,597	67	4
No. Years	52	52	52	52	52	52	
Average/Year	9.4	1.5	16,194	0.2	77,838	1.3	0.08
Sources	ANHC (2018)	ANHC (2018)	A&H Biennial Reports (1960-2016)	NC Session Laws (online)	NC Session Laws (online)	Google Scholar (2018.01.14)	UAB Biblio (2016)
*to 6/30/2017							
2018.04.07							

TABLE F.2. CSS Neuse: players' indicator data. (Table by author, data sources as in table and Chapter 2).

UCH Site: Players' Interest Indicator Data: Lake Phelps Canoes

Lake Phelps Canoes	PHL0001-0028	Washington/Tyrell County		Lake Phelps		OBX
Interest:	Public		Political		Professional	
	Reading public	Visiting	Legislation	Appropriation	Google Scholar	UAB Biblio
Keyword Search	"Lake Phelps" and "canoe"				"Lake Phelps" and "canoe"	
Indicator	Number Relevant Articles	Number Visitors	Number Acts	Amount Non-Recurring (NR) \$	Number Publications	Number References (by ID#)
1960-1962						
1962-1964						
1964-1966						
1966-1968						
1968-1970						
1970-1972						
1972-1974						
1974-1976						
1976-1978						
1978-1980						
1980-1982						1
1982-1984						
1984-1986	1					29
1986-1988	1					19
1988-1990	4					
1990-1992	2					
1992-1994	1				1	1
1994-1996	0				2	
1996-1998	0					
1998-2000	1				1	
2000-2002	0					
2002-2004	1				2	5
2004-2006	0				2	
2006-2008	1					1
2008-2010	0				4	2
2010-2012	4				1	
2012-2014	1				4	
2014-2016	1				4	
2016-2018*	0				1	
Totals	18	NA	0	0	23	57
No. Years	17				34	34
Average/Year	1		0	0	0.7	1.7
Sources:	ANHC db (2018)	See Pettigrew State Park	NC Session Laws (online)	NC Session Laws (online)	Google Scholar (2018.01.14)	UAB Biblio (2016)
*to 6/30/2017						
2018.04.07						

TABLE F.3. Lake Phelps Canoes: players' indicator data. (Table by author, data sources as in table and Chapter 2).

UCH Site: Players' Interest Indicator Data: USS *Huron*

USS <i>Huron</i>	BOB0012	Dare County	Nags Head	Ocean	Hatteras	OBX
Interest	Public		Political		Professional	
	Reading public	Visiting	Legislation	Appropriation	Google Scholar	UAB Biblio
Keyword Search	"Huron" and "Nags Head"				"Huron" and "Nags Head"	
Indicators:	Number Relevant Articles	Number Visitors	Number Acts	Amount Non-Recurring (NR) \$	Number Publications	Number References (by ID#)
1960-1962	0					
1962-1964	0					
1964-1966	1					
1966-1968						
1968-1970						
1970-1972						
1972-1974						
1974-1976						1
1976-1978						
1978-1980	1					
1980-1982						2
1982-1984						
1984-1986	1					
1986-1988	5				1	2
1988-1990					1	1
1990-1992	4	300			1	2
1992-1994	3	600			1	
1994-1996	3	600			3	
1996-1998	1	600			2	
1998-2000	0	600			2	
2000-2002	2	600			3	
2002-2004	0	600			4	1
2004-2006	2	600			5	
2006-2008	0	600			4	
2008-2010	0	600			3	
2010-2012	0	600			6	
2012-2014	0	600			3	
2014-2016	0	600			2	
2016-2018*	0	300			1	
Totals	23	7,800	0	0	45	6
No. Years	56	26			56	56
Average/Year	0.4	300	0	0	1	0.1
Sources:	ANHC db (2018)	Lawrence 2003	NC Session Laws (online)	NC Session Laws (online)	Google Scholar (2018.01.14)	UAB Biblio (2016)
		See also Jockey's Ridge State Park				
* to 06/30/2017						
2018.04.07						

TABLE F.4. USS *Huron*: players' indicator data. (Table by author, data sources as in table and Chapter 2).

UCH Site: Players' Interest Indicator Data: *Queen Anne's Revenge*

Queen Anne's Revenge	BUI0003 31CR314	Carteret County	Beaufort	Ocean/ Inlet	Onslow Bay N	OBX
Interest:	Public		Political		Professional	
	Reading public	Visiting	Legislation	Appropriation	Google Scholar	UAB Biblio
Keyword Search:	"Queen Anne's Revenge"				"Queen Anne's Revenge"	
Indicators:	Number Relevant Articles	Number Visitors	Number Acts	Amount Non-Recurring (NR) \$	Number Publications	Number References (by ID#)
1960-1962						
1962-1964						
1964-1966	1				1	1
1966-1968	0					1
1968-1970						
1970-1972						
1972-1974	1				1	
1974-1976	3					
1976-1978	1				1	
1978-1980	2				1	
1980-1982	6				1	
1982-1984	4				1	
1984-1986	12					
1986-1988	5					
1988-1990	2					
1990-1992	2				1	
1992-1994	1				2	
1994-1996	2					
1996-1998	98		1	200,000	7	7
1998-2000	122		1	352,735	24	14
2000-2002	72		2	419,818	33	26
2002-2004	45				18	9
2004-2006	66		2	150,000	30	19
2006-2008	103		2	397,040	29	27
2008-2010	112		1	143,000	28	18
2010-2012	202			250,000	24	5
2012-2014	145				21	
2014-2016	114		3	929,161	23	2
2016-2018*	28		2	570,839	4	
Totals	1,149	NA	14	3,412,593	250	129
No. Years	56		21	21	21	21
Average/Year	20.5		0.6	162,504	12	6
Sources	ANHC db (2018)	See NCMM	NC Session Laws (online)	NC Session Laws (Online)	Google Scholar (2018.01.14)	UAB Biblio. (2016)
	"La Concorde" and "Blackbeard"					
1960-2017	33					
*to 06/30/2017						
2018.04.07						

TABLE F.5. *Queen Anne's Revenge*: players' indicator data. (Table by author, data sources in table and Chapter 2).

UCH Site: Players' Interest Indicator Data: "George Browne" Wreck

"George Brown" Wreck	CKB0022	Currituck County	Corolla	Ocean/Beach	Hatteras	OBX
Interest:	Public		Political		Professional	
Keyword Search	Reading public "Corolla" and "Shipwrecks"	Visiting	Legislation	Appropriation	Google Scholar "Corolla" and "shipwreck" and "North Carolina"	UAB Biblio
Indicators:	Number Relevant Articles	Number Visitors	Number Acts	Amount Non-Recurring (NR) \$	Number Publications	Number References (by ID#)
1960-1962	1					
1962-1964	2					
1964-1966						
1966-1968	1					
1968-1970						
1970-1972						
1972-1974						
1974-1976	1					
1976-1978						1
1978-1980						
1980-1982						
1982-1984	1					
1984-1986	1					
1986-1988						
1988-1990						2
1990-1992						
1992-1994	2					
1994-1996	1					2
1996-1998	1					2
1998-2000	3					2
2000-2002						2
2002-2004						5
2004-2006	1					2
2006-2008	4					5
2008-2010	1					4
2010-2012	4					6
2012-2014	4					7
2014-2016	9					4
2016-2018*	1					2
Totals	38	NA	0	0	46	1
No Years	56				11	
Av/Yr	0.7				4	0.09
Sources:	ANHC db (2018)	See Graveyard of Atlantic Museum	NC Session Laws (online)	NC Session Laws (online)	Google Scholar (2018.01.14)	UAB Biblio. (2016)
* to 2017.06.30						
2018.04.07						

TABLE F.6. "George Browne" Wreck: players' indicator data. (Table by author, data sources: table, and Chapter 2).

ASA: Players' Interest Indicator Data: Fort Fisher Historic Site

Fort Fisher Historic Site	New Hanover County	Fort Fisher Kure Beach				OBX
Interest:	Public		Political		Professional	
	Reading public	Visiting (FF)	Legislation	Appropriation	Google Scholar	UAB Biblio
Keyword Search	"Fort Fisher State Historic Site"					
Indicator	Number Relevant Articles	Number Visitors	Number Acts	Amount Non-Recurring (NR) \$	Number Publications	Number References (by ID#)
1960-1962	14	100,000	1	47,000		
1962-1964	25	344,830	1	96,000		
1964-1966	13	350,000				
1966-1968	16	280,041				
1968-1970	23	292,353				
1970-1972	9	221,772		21,782		1
1972-1974	2	268,467				1
1974-1976	5	219,705				
1976-1978	10	224,356	1	91,000		1
1978-1980	29	186,980		30,000		1
1980-1982	14	252,231				1
1982-1984	13	279,992				1
1984-1986	16	261,790				
1986-1988	13	337,479		13,800		
1988-1990	30	301,151				
1990-1992	17	317,572	1	250,000		
1992-1994	23	328,704	2	4,499,000		1
1994-1996	33	332,565				1
1996-1998	31	252,733		42,600		1
1998-2000	46	245,454		1,676,135		1
2000-2002	64	1,159,302				4
2002-2004	50	1,544,898				1
2004-2006	39	1,059,026		8,000		3
2006-2008	85	1,130,298				1
2008-2010	100	1,176,000				7
2010-2012	50	1,281,542				7
2012-2014	47	1,300,229				4
2014-2016	60	1,600,000	2	6,925,000		2
2016-2018*	32		1	590,000		0
Totals	909	15,649,470	9	14,290,317		39 NA
No Years	56	56	56	56		56
Av/Yr	18	279,454	0.2	255,184		0.7
Sources	ANHC db (ann)	A&H Biennial Reports(1960-2016)	NC Session Laws (online)	NC Session Laws (online)	Google Scholar (2018.04.07)	
*6/30/17						
208/04/07						

TABLE F.7.Fort Fisher Historic Site: players' indicator data. (Table by author, data sources: table, and Chapter 2).

ASA: Players' Interest Indicator Data: CSS Neuse/Fort Caswell Historic Site

CSS Neuse/ Fort Caswell Historic Site	Lenoir County	Kinston				IBX
Interest:	Public		Political		Professional	
	Reading public	Visiting	Legislation	Appropriation	Google Scholar	UAB Biblio
Keyword Search:	"CSS Neuse State Historic Site"					
Indicator:	Number Relevant Articles	Number Visitors	Number Acts	Amount Non-Recurring (NR) \$	Number Publications	Number References (by ID#)
1960-1962	0					
1962-1964	0					
1964-1966	0	12,286				
1966-1968	0	34,416				
1968-1970	0	46,395				
1970-1972	0	46,395				
1972-1974	0	53,397				
1974-1976	0	57,648				
1976-1978	0	44,775				
1978-1980	0	33,411				
1980-1982	2	43,001				
1982-1984	0	36,476				
1984-1986	2	28,101				
1986-1988	0	27,411				
1988-1990	0	24,539				
1990-1992	0	27,388				
1992-1994	0	34,940				
1994-1996	2	33,465				1
1996-1998	4	34,745				
1998-2000	3	31,114				
2000-2002	6	35,050				2
2002-2004	9	24,934				2
2004-2006	7	21,175				1
2006-2008	8	21,807				
2008-2010	19	21,807				2
2010-2012	26	20,304				1
2012-2014	16	23,569				1
2014-2016	11	23,569				
2016-2018*	3					
Totals	118	842,118	See CSS Neuse	See CSS Neuse	10	
No. Years	52	52				52
Average/Year	2.3	16,194				0.2
Sources:	ANHC db (2018)	A&H Biennial Reports			Google Scholar 2018.04.07	
*to 6/30/2017						
2018.04.07						

TABLE F.8. CSS Neuse/Fort Caswell Historic Site: players' indicator data. (Table by author, data sources: table, and Chapter 2).

ASA: Players' Interest Indicator Data: Pettigrew State Park

Pettigrew State Park		Washington/Tyrell County				OBX
Interest	Public		Political		Professional	
	Reading	Visiting	Legislation	Appropriation	Google Scholar	UAB Biblio
Keyword Search	"Pettigrew State Park"					
Indicator	Number Relevant Articles	Number Visitors	Number Acts	Amount Non-Recurring (NR) \$	Number Publications	Number References (by ID#)
1960-1962	8		1	16,500		
1962-1964	10		1	5,000	1	
1964-1966	19		3	52,527		
1966-1968	7					
1968-1970	5		1	6,000		
1970-1972	26				1	
1972-1974	6					
1974-1976	20					
1976-1978*	10	100,000			1	
1978-1980*	2	89,000	1			
1980-1982*	3	115,000			1	
1982-1984*	6	117,000				
1984-1986*	6	100,000	1		2	
1986-1988*	5	95,000				
1988-1990*	30	153,000			2	
1990-1992*	5	158,000				
1992-1994	2		1	90,600	4	
1994-1996	4					
1996-1998	0			170,627	2	
1998-2000	5				4	
2000-2002	6				5	
2002-2004	6				3	
2004-2006	6				8	
2006-2008	9				9	
2008-2010	1				12	
2010-2012**	7	142,728			3	
2012-2014	5				17	
2014-2016	10		1	2,830,500	8	
2016-2018***	8				2	
Totals	237		10	3,171,754	85	NA
No Years	56		56	56	56	
Average/Year	5		0.2	56,638	1.5	
Sources:	ANHC db (2018)	** NCPED (2012)	NC Session Laws Online	NC Session Laws Online	Google Scholar 2018.04.07	
	***to 6/30/2017	* NCDPR1994:iv-2				

TABLE F.9. Pettigrew State Park: players' indicator data. (Table by author, data sources: table, and Chapter 2).

ASA: Players' Interest Indicator Data: Jockeys Ridge State Park

Jockeys Ridge State Park	Dare County	Nags Head				OBX
Interest:	Public		Political		Professional	
	Reading public	Visiting	Legislation	Appropriation	Google Scholar	UAB Biblio
Keyword Search:	"Jockeys Ridge State Park"					
Indicators:	Number Relevant Articles	Number Visitors	Number Acts	Amount Non-Recurring (NR) \$	Number Publications	Number References (by ID#)
1960-1962						
1962-1964						
1964-1966						
1966-1968						
1968-1970						
1970-1972						
1972-1974	1					
1974-1976	3					
1976-1978	17					1
1978-1980*	24	370,000	1			1
1980-1982*	43	420,000	1			1
1982-1984*	16	550,000				1
1984-1986*	11	580,000				
1986-1988*	39	750,000				
1988-1990*	32	950,000				
1990-1992*	13	1,300,000				
1992-1994*	17					4
1994-1996	8		1			2
1996-1998	18					2
1998-2000	21					3
2000-2002	15					
2002-2004	25					4
2004-2006	18					6
2006-2008	29					1
2008-2010	33					4
2010-2012**	50	3,221,376				6
2012-2014	33					5
2014-2016	30		1	751,000		8
2016-2018***	26					1
	522		4	751,000		50 NA
No. Years	44		44	43		43
Average/Year	12		0.1	17,465		1.2
Sources:	ANHC db (2018)	**NCPED (2012)	NC Session Laws (online)	NC Session Laws (online)	Google Scholar (2018.04.07)	
	*** to 06/30/2017	*NCDPR 1993:iv-2				

TABLE F.10. Jockey's Ridge State Park: players' indicator data. (Table by author, data sources: table, and Chapter 2).

ASA: Players' Interest Indicator Data: NC Maritime Museum (Beaufort)

NC Maritime Museum (NCMM)	Carteret County	Beaufort	Waterfront			OBX
Interest:	Public		Political		Professional	
Keyword Search:	Reading public	Visiting	Legislation	Appropriation	Google Scholar	UAB Biblio
Indicator	Number Relevant Articles	Number Visitors	Number Acts	Amount Non-Recurring (NR) \$	Number Publications	Number References (by ID#)
1960-1962						
1962-1964						
1964-1966						
1966-1968						
1968-1970						
1970-1972						
1972-1974						
1974-1976						
1976-1978						
1978-1980						
1980-1982						
1982-1984			1			
1984-1986	10		2	220,000	1	
1986-1988	24		2	75,000	3	
1988-1990	9				6	
1990-1992	13		1		4	
1992-1994	2				13	
1994-1996	3		1		11	
1996-1998	6	363,037	2	1,500,000	21	
1998-2000	20	394,813	2		8	
2000-2002	13	396,489			20	
2002-2004	13	417,073			9	
2004-2006	12	586,993	1	1,650,000	18	
2006-2008	13	781,415			21	
2008-2010	27	347,197	1	130,000	24	
2010-2012	57	541,064			24	
2012-2014	22	497,617	1		23	
2014-2016	22	406,495		175,000	22	
2016-2018	9				5	
Totals	275	4,732,193	14	3,750,000	233	0
No. Years	35	21	35	21		
Average/Year	8	225,343	0.4	178,571		
Sources:	ANHC db (2018)	A&H Biennial Reports (1960-2016)	NC Session Laws (online)	NC Session Laws (online)	Google Scholar (2018.04.07)	NA
*to 06/30/2017						
2018.04.07						

TABLE F.11. NC Maritime Museum, Beaufort: players' indicator data. (Table by author, data sources: table, and Chapter 2).

ASA: Players' Interest Indicator Data: Graveyard of the Atlantic Museum (Hatteras)

Graveyard of the Atlantic Museum	Dare County	Hatteras	Hatteras Island	Beach	Hatteras	OBX
Interest	Public		Political		Professional	
	Reading public	Visiting	Legislation	Appropriation	Google Scholar	UAB Biblio
Keyword Search:	"Graveyard of the Atlantic Museum"					
Indicator	Number Relevant Articles	Number Visitors	Number Acts	Amount Non-Recurring (NR) \$	Number Publications	Number References (by ID#)
1960-1962						
1962-1964						
1964-1966						
1966-1968						
1968-1970						
1970-1972						
1972-1974						
1974-1976						
1976-1978						
1978-1980						
1980-1982						
1982-1984						
1984-1986						
1986-1988						
1988-1990	2					
1990-1992						
1992-1994	2					1
1994-1996	8		1	800,000		
1996-1998	12					3
1998-2000	7		1	1,500,000		
2000-2002	1					1
2002-2004	15					4
2004-2006	15			100,000		2
2006-2008	16		2	300,000		
2008-2010	25					4
2010-2012	32	143,539				4
2012-2014	24	170,914				4
2014-2016	28	165,750				4
2016-2018*	10					0
Totals	197	480,203	4	2,700,000		27
No Years	31	7	31	31		31
Av/Yr		68,600	0.1	87,100		1
Sources:	ANHC db (2018)	A&H Biennial Reports (1960-2016)	NC Session Laws (online)	NC Session Laws (online)	Google Scholar (2018.04.07)	NA
*to 2018.06.30			Dew 1994 N&O	Dew 1994 N&O		
2018.04.07			Star News Wilm	Star News Wilm		
			N&O 24/11/04	N&O 24/11/04		

TABLE F.12. Graveyard of the Atlantic Museum, Hatteras: players' indicator data. (Table by author, data sources: table, and Chapter 2)

APPENDIX G: NC HIGHWAY HISTORICAL MARKERS WITH MARITIME THEME

Marker ID#	Year Cast	County	Region	Location	Title	Category
K-7	1938	Anson	P	Morven	Sneedsborough	Economy
OO-2	1958	Catawba	P	Claremont	Bunker Hill Covered Bridge	Place
H-10	1937	Chatham	P	Pittsboro	Captain Johnston Blakeley	Military War 1812
H-17	1939	Chatham	P	Pittsboro	James I Waddell	Military
H-18	1939	Chatham	P	Moncure	Ramsey's Mill	Military Revolutionary War
MM-1	1964	Iredell	P	Lake Norman	Early History	Place
OO-1	1964	Lincoln	P	Lake Norman	Early Trans-Catawba History	Place
L-56	1954	Mecklenburg	P	Charlotte	Confederate Navy Yard	Military Civil War
J-88	1989	Rockingham	P	Eden	Barnett Canal	Economy
J-90	1989	Rockingham	P	Madison	Slink Shoal Sluice	Economy
J-91	1990	Rockingham	P	Eden	Leaksville Landing	Economy
O-37	1951	Rutherford	M	Rutherfordton	Joshua Forman	Economy
J-68	1976	Stokes	P	Pinnacle	Bean Shoals Canal	Economy
E-102	1991	Warren	P	Warrenton	John H. Kerr 1873-1958	Economy

TABLE G.1. NC Highway Historical Markers in Piedmont (P) and Mountain (M) region counties with maritime theme. (Table by author; data source NC HHM 2011).

Marker ID#	Year Cast	County	Region	Location	Title	Category
I-54	1960	Cumberland	CP IBX	Fayetteville	Campbelton	Economy
E-11	1938	Halifax	CP IBX	Scotland Neck	Ram Albemarle	Military Civil War
E-34	1948	Halifax	CP IBX	Roanoke Rapids	Roanoke Canal	Economy
E-35	1948	Halifax	CP IBX	Weldon	Roanoke Canal	Economy
E-53	1954	Halifax	CP IBX	Scotland Neck	Roanoke River	Economy
E-55	1954	Halifax	CP IBX	Weldon	Roanoke River	Economy
EEE-1	1962	Halifax	CP IBX	Halifax	Ram Albemarle	Military Civil War
H-42	1948	Harnett	CP IBX	Erwin	Smiley's Falls	Economy
HHH-23	1959	Johnston	CP IBX	Bentonville Battleground	Mill Creek	Military Civil War
F-15	1940	Lenoir	CP IBX	Kinston	Ram Neuse	Military Civil War
FF-1	1989	Lenoir	CP IBX	Kinston	Battle of Wyse Fork March 8-10 1865	Military Civil War
B-18	1939	Martin	CP IBX	Williamston	Fort Branch	Military Civil War
B-34	1954	Martin	CP IBX	Williamston	Roanoke River	Economy
E-54	1954	Northampton	CP IBX	Rich Square	Roanoke River	Military WW1
E-56	1954	Northampton	CP IBX	Garysburg	Roanoke River	Military WW1
I-69	1988	Sampson	CP IBX	Clear Run	Steamboat Trade	Economy
F-44	1970	Wayne	CP IBX	Seven Springs	Battle of Whitehall	Military Civil War

TABLE G.2. NC Highway Historical Markers in Coastal Plain Inner Banks counties (CP IBX) with maritime theme. (Table by author; data source NC HHM 2011).

Marker ID#	Year Cast	County	Region	Location	Title	Category
BB-3	1962	Beaufort	CP OBX	Bath	Palmer-Marsh House	Economy
BB-1	1962	Beaufort	CP OBX	Bath	Colonial Bath	Place
B-47	1968	Beaufort	CP OBX	Bath	Edward Teach	Pirate
BB-2	1970	Beaufort	CP OBX	Bath	Historic Bath	Place
B-51	1987	Beaufort	CP OBX	Washington	John Gray Bount 1752-1833	Economy
B-56	1989	Beaufort	CP OBX	Bath	James Adams Floating Theater	Leisure
B-62	2004	Beaufort	CP OBX	Bath	Port of Bath	Economy
B-65	2008	Beaufort	CP OBX	Washington	John H. Small 1858-1946	Economy
A-48	1954	Bertie	CP OBX	Roanoke R Bridge	Roanoke River	Economy
A-57	1962	Bertie	CP OBX	nr Windsor	Naval Battle 1864	Military Civil War
A-10	2000	Bertie	CP OBX	Chowan R bridge	Salmon Creek & Eden House; Seedbed of the Colony	Place
D-8	1936	Brunswick	CP OBX	Southport	Fort Caswell	Military Civil War
D-11	1938	Brunswick	CP OBX	Southport	Fort Johnston	Military Revolutionary War
D-54	1954	Brunswick	CP OBX	Orton	Brunswick	Economy
D-62	1960	Brunswick	CP OBX	Yaupon Beach	Fort Caswell	Military Civil War
DDD-1	1961	Brunswick	CP OBX	Brunswick Town Historic Site	Fort Anderson	Military Civil War
DDD-2	1961	Brunswick	CP OBX	Belville	Fort Anderson	Military Civil War
D-66	1962	Brunswick	CP OBX	Southport	Bald Head Lighthouse	Economy
D-89	1988	Brunswick	CP OBX	Southport	Josiah Martin	Military Revolutionary War
D-110	2007	Brunswick	CP OBX	Southport	Stede Bonnet 1688-1718	Pirate
A8	1936	Camden	CP OBX	South Mills	Battle of South Mills	Military Civil War
A-8	1936	Camden	CP OBX	South Mills	Battle of South Mills	Military Civil War
A-12	1936	Camden	CP OBX	South Mills	Dismal Swamp Canal	Place
C-9	1936	Carteret	CP OBX	Morehead City	Fort Macon	Military
C-4	1936	Carteret	CP OBX	Cedar Island ferry landing	Ocracoke Inlet	Pirate
C-21	1941	Carteret	CP OBX	Beaufort	Whale Fishery	Economy
CC-3	1962	Carteret	CP OBX	Morehead City	Seige of Fort Macon	Military Civil War
C-55	1977	Carteret	CP OBX	Shell Point	Fort Hancock	Military Revolutionary War
C-59	1986	Carteret	CP OBX	Pine Knoll Shores	Verrazano	Place
C-63	1987	Carteret	CP OBX	Morehead City	Camp Glen	Military
C-69	1992	Carteret	CP OBX	Beaufort	Marine Research	Science
C-24	1994	Carteret	CP OBX	Shell Point	Cape Lookout Lighthouse	Economy
C-77	2005	Carteret	CP OBX	Pine Knoll Shores	SS Pevensey	Military Civil War
A-27	1942	Chowan	CP OBX	Edenton	Mackeys' Ferry	Economy
C-10	1938	Craven	CP OBX	New Bern	Baron de Graffenheid	Place
C-23	1942	Craven	CP OBX	Lima, Neuse R bridge	Streets Ferry	Place
CC-1	1962	Craven	CP OBX	New Bern	Battle of New Bern	Military Civil War
C-67	1989	Craven	CP OBX	New Bern	USRC Diligence	Government
A-66	1971	Currituck	CP OBX	nr Shawboro	McNight's Shipyard	Economy
A-76	1991	Currituck	CP OBX	Coinkock	Albemarle & Chesapeake Canal	Economy
A-33	2003	Currituck	CP OBX	Corolla	Wreck of Metropolis	Economy
B-31	1953	Dare	CP OBX	Bladen St. Nags Head	Wreck of USS Huron	Economy
B-32	1953	Dare	CP OBX	Hatteras	Billy Mitchell 1879-1936	Military
B-30	1953	Dare	CP OBX	Rodanthe	Mirfo Rescue	Military WW1
B-64	1961	Dare	CP OBX	Croatian Sound Bridge	Fort Blanchard	Military Civil War
BB-4	1961	Dare	CP OBX	US64/264	Battle of Roanoke Island	Military Civil War
BB-5	1961	Dare	CP OBX	Manteo	Naval Battle of Roanoke Island	Military Civil War
BBB-2	1961	Dare	CP OBX	Manteo	Fort Barrow	Military Civil War
BBB-3	1961	Dare	CP OBX	Manteo	Confederate Channel Obst	Military Civil War
B-41	1962	Dare	CP OBX	Buxton	Diamond Shoals	Military WWII
B-50	1976	Dare	CP OBX	Hatteras	USS Monitor	Military Civil War
B-54	1989	Dare	CP OBX	Buxton	Cape Hatteras Lighthouse	Economy
B-60	2000	Dare	CP OBX	Bonner Bridge	Port Fernando	Place
B-66	2010	Dare	CP OBX	Pea Island	Pea Island Lifesavers	Economy
A-17	1939	Gate	CP OBX	Folly	George Washington	Government
A-31	1948	Gates	CP OBX	Chowan R. Bridge	Early Exploration	Place
A-45	1954	Hertford	CP OBX	Chowan R Bridge	Lane's Expedition	Place
B-19	1940	Hyde	CP OBX	Swan Quarter	British Invasion	Military War 1812
B-43	1965	Hyde	CP OBX	Ocracoke Ferry landing	L.T. Robert Maynard	Pirate
B-55	1989	Hyde	CP OBX	Ocracoke	Ocracoke Lighthouse	Economy
D-12	1938	New Hanover	CP OBX	Fort Fisher	Fort Fisher	Military Civil War
D-22	1940	New Hanover	CP OBX	Castle Hayne	Early Drawbridge	Military Revolutionary War
D-37	1949	New Hanover	CP OBX	Wilmington	Captain Johnston Blakeley	Military War 1812
D-43	1950	New Hanover	CP OBX	Wilmington	John A. Winslow	Military Civil War
D-57	1955	New Hanover	CP OBX	Wilmington	Rose Greenhow	Military Civil War
D-60	1959	New Hanover	CP OBX	Wilmington	Beery's Shipyard	Military Civil War
D-61	1959	New Hanover	CP OBX	Wilmington	John N. Maffitt	Military Civil War
DDD-3	1962	New Hanover	CP OBX	Wilmington	Cassidy Shipyard	Military Civil War
D-86	1987	New Hanover	CP OBX	Wilmington	USS North Carolina	Military WWII
D-96	1992	New Hanover	CP OBX	Wilmington	North Carolina Shipbuilding Co	Military WWII
D-98	1992	New Hanover	CP OBX	Kure Beach	Bromine Extraction	Science
D-47	1951	New Hanover	CP OBX	Wilmington	Edwin A. Anderson	Military WW1
C-26	1949	Onslow	CP OBX	Swansboro	Otway Burns	Military War 1812
C-38	1959	Onslow	CP OBX	Jacksonville	Onslow Raid	Military Civil War
C-44	1965	Onslow	CP OBX	Swansboro	Port Swansborough	Economy
C-54	1976	Onslow	CP OBX	Swansboro	Prometheus	Military War 1812
D-104	1995	Pender	CP OBX	Topsail Beach	Missile Tests	Military
B-10	1938	Washington	CP OBX	Plymouth	Ram Albemarle	Military Civil War
B-9	1938	Washington	CP OBX	Plymouth	Battle of Plymouth	Military Civil War
B-22	1942	Washington	CP OBX	Roper	Mackey's Ferry	Economy
B-35	1955	Washington	CP OBX	Creswell	Lake Company	Economy
BBB-8	1961	Washington	CP OBX	Plymouth	Naval Action	Military Civil War
BB-6	1962	Washington	CP OBX	Plymouth	Battle of Plymouth	Military Civil War

TABLE G.3. NC Highway Historical Markers in Coastal Plain Outer Banks counties (CP OBX) with maritime theme. (Table by author; data source NC HHM 2011).

APPENDIX H: ESTIMATION DAILY CIRCULATION NUMBER ARTICLES IN NORTH CAROLINA SOURCES FOR UCH SITES AND ASAS

Keyword Search on:	Total No. articles 1960-2017	Total No. Publications	Top Three Publications by No. Articles	No. Articles Top Three Pub.	Approx. Daily Circulation Top. Three Pub.	Top Three: Total No. Articles x Approx Daily Circulation	Rank Order
"Modern Greece" and "Fort Fisher"	71	14	Charlotte Observer	18	147,000	2,646,000	
			News & Observer, Raleigh	17	130,000	2,210,000	
			Star News, Wilmington	17	39,000	663,000	
Totals	71	14		3	316,000	16,432,000	3
"CSS Neuse"	477	37	News & Observer Raleigh	38	130,000	4,940,000	
			Free Press Kinston	291	10,000	2,910,000	
			Daily Reflector Gvile	35	23,000	805,000	
Totals	477	37		3	163,000	59,332,000	5
"Lake Phelps" and "canoe"	17	12	News and Observer Raleigh	5	130,000	650,000	
			Charlotte Observer	2	147,000	294,000	
			Fayetteville Observer	2	50,000	100,000	
Total	17	12		4	327,000	2,943,000	1
"Huron" and "Nags Head"	20	8	News & Observer Raleigh	7	130,000	910,000	
			Charlotte Observer	3	147,000	441,000	
			Greensboro Daily News	3	57,000	171,000	
Totals	20	8		3	334,000	4,342,000	4
"Queen Anne's Revenge"	1,150	52	Charlotte Observer	112	147,000	16,464,000	
			News & Observer Raleigh	122	130,000	15,860,000	
			News & Record, Greensboro	104	57,000	5,928,000	
Totals	1,150	52		8	334,000	112,892,000	6
"Corolla" and "shipwrecks"	21	14	Charlotte Observer	7	147,000	1,029,000	
			News and Observer, Raleigh	4	130,000	520,000	
			Greensboro Daily News; Record; News and Record	7	57,000	399,000	
Totals	21	14		6	334,000	6,012,000	2
"Ram Neuse"	179	11	News & Observer, Raleigh	72	130,000	9,360,000	
			News; Record	86	57,000	4,902,000	
			Charlotte Observer	23	147,000	3,381,000	
Total	179	11		5	334,000	60,454,000	5

TABLE H.1. Numbers articles for UCH keyword searches in North Carolina news sources 1960-2017, and estimated daily circulation of news sources. (Table by author, data sources: ANHC 2018; Table H.2).

Publication	Approx. Daily Circulation
Pilot#	1,000
Cleveland Post	1,000
Elizabeth City Daily Advance***	10,000
Kinston: Free Press **	10,000
Carteret County News-Times, Morehead*****	12,000
Robesonian****	14,000
Durham: Herald Sun, Durham*	21,000
Jacksonville: Daily News##	21,000
Greenville: Daily Reflector *	23,000
Wilmington: Star News*	39,000
Fayetteville: Observer*	50,000
Greensboro: News & Record*	57,000
Raleigh: News & Observer *	130,000
Charlotte: Charlotte Observer*	147,000
Total	536,000
*	https://www.cision.com/us/2012/08/top-10-daily-newspapers-in-north-carolina/
**	http://www.self.gutenberg.org/articles/Kinston_Free_Press
***	http://www.inlandpress.org/stories/how-a-north-carolina-newspaper-publisher-streamlined-operations.6213?
****	https://www.google.com/search?q=+Robesonian+news+paper+circulation&ie=utf-8&oe=utf-8&client=firefox-b
*****	http://www.gabler.com/Carteret+County+News-Times-NC-Newspaper-Advertising-Costs++7910
#	http://www.thepilot.com/site/about.html
##	http://www.nationwideadvertising.com/iaconcarjas.html
###	author estimate

TABLE H.2. North Carolina news sources approximate daily circulations 2010-2012. (Table by author, data sources: ANHC 2018; as listed in table).

